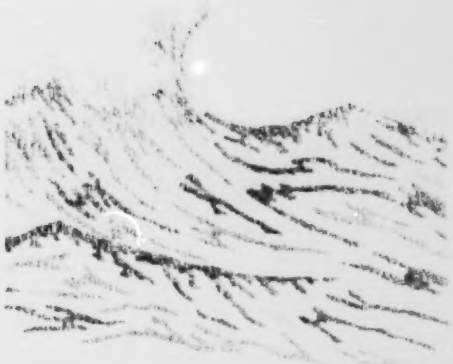
FISHERIES RESOURCE CONSERVATION COUNCIL

2001 Conservation Requirements for Scotian Shelf and Bay of Fundy Groundfish Stocks and Redfish Stocks

Report to the Minister of Fisheries and Oceans



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LETTER TO THE MINISTER

January 18, 2001

Honourable Herb Dhaliwal
Minister of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario
K1A 0E6

Dear Minister:

The Fisheries Resource Conservation Council (FRCC) herewith presents to you its report on *2001 Conservation Requirements for Scotian Shelf and Bay of Fundy Groundfish Stocks and Redfish Stocks*.

Generally, the Council finds little change in the status of groundfish stocks in areas 4VWX+5Y. The only increased TAC which the Council has recommended is for 3NOPs4VWX5Zc Atlantic halibut, in recognition of the industry's view that the stock condition continues to improve, and while we await the scientific assessment which is planned for 2001.

The Council has recommended that a limited index fishery be conducted for 4Vn cod. It is the Council's hope that such a fishery will serve to bridge the gap between fishermen's views of the resource and that portrayed by the limited research vessel survey.

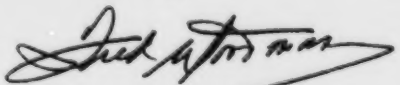
With respect to 4X cod, the Council is unable to advise you as to whether the three year objective of a 40,000t spawning stock biomass which you established in March 2000 will be achieved. A combination of events – older fish which are not caught but are thought to be present in the stock, and incoming 1998 and 1999 year classes which must be significantly stronger than all of the previous 5 years which are the lowest on record – is required to occur for your target to be reached in the established timeframe.

The Council's advice on Unit 2 redfish is based on establishing a conservative harvest rate for the 1980 year class of *Sebastes mentella* upon which the fishery will be dependent until it is determined whether the 1988 year class of *Sebastes fasciatus* will support the fishery into the future.

The Council continues to be concerned about growing grey seal populations, their expanded range, and their impact on groundfish stocks, especially that on juveniles in nursery areas. During our consultations, fishermen in all areas reported that grey and harbour seals were present in greater numbers than in the past. In particular, the Council has recommended that the Department evaluate measures to protect juvenile groundfish in the Bird Island area.

I trust that you find this report helpful.

Sincerely,



Fred Woodman
Chairman

Chapter 1: Introduction

Assessment of Stocks

The FRCC notes that many of the stocks which are the focus of this report have not undergone full assessments this year. In some cases, it has been a number of years since the last full assessment.

In its December 2000 letter on priorities for DFO Science (appended to this report) to the Minister of Fisheries and Oceans, the Council set out certain criteria to be used in determining which stocks are assessed as well as the timing of these assessments. In doing so, the Council wishes to avoid an "open-ended" postponing of assessments. In addition, where the Department of Fisheries and Oceans determines that an assessment of a stock is not to be undertaken, the Council has set out certain basic information which must be provided in order to monitor and evaluate stock trends.

Changes in Catchability of Research Vessel Surveys

The FRCC has observed a potentially alarming trend in the assessment of several groundfish stocks, namely, an apparent reduced catchability of older ages by the Scotian Shelf research vessel summer survey. The consequences of this reduction in survey catchability are lower than expected numbers of fish being observed in the survey catches, and the subsequent need to rationalize these observations in analytical assessments perhaps as increases in total mortality, or changes in fish behaviour. The difficulties associated with verifying these more hypothetical assumptions increase the uncertainty of stock status estimators.

Toward better understanding of the cause and effect of year-over-year changes in survey observations, it is important to have data on year-over-year differences in the research vessel surveys, e.g., timing differences of surveys, differences in conditions at time of surveys and unanticipated events (i.e., breakdowns, weather, etc.) that together may explain catchability differences from year-to-year.

The FRCC requests that DFO Science review the annual research vessel survey and provide a more complete report on the timing and conditions during surveys, including identifying year-over-year differences that may impact survey catchability of groundfish.

Oil & Gas

During consultations at Sydney, concerns were expressed regarding the potential negative effects of various oil and gas activities. The Council has previously shared similar concerns of the fishing industry within the Gulf of St. Lawrence and on Georges Bank.

The Council recommends that effective dialogue take place between representatives of both of these industry sectors. The Council further recommends that potential impacts of proposed oil and gas activities on the fishery, on the fisheries resource, and on critical habitat be properly assessed by the Federal Government. The conduct of this assessment should begin immediately. As soon as possible thereafter, governments, in consultation with both industry sectors, should develop a framework to limit the activities of the oil and gas industry as appropriate.

Sentinel Surveys

The FRCC was an early proponent of the use of sentinel fisheries as a key source of stock status information (especially for stocks that cannot be regularly assessed), as well as important vehicles for communications between scientists and the fishing industry. The Council continues to ardently support these initiatives. Indeed, the Department must continually seek new ways to expand the role of fishermen in data collection, through new sentinel fisheries projects, index fisheries, and other cooperative means.

The FRCC is supportive of sentinel fishery programs for groundfish stocks throughout the Scotia-Fundy region and encourages wherever possible the continuation, expansion and coordination of these programs during the critical period of stock rebuilding.

Oceanographic Conditions

For the first 9 months of the year 2000, monthly mean air temperatures at Shearwater near Halifax and on Sable Island were above normal (relative to the 1961-90 means), except July at Shearwater. The largest anomalies occurred during the winter (January to April) with amplitudes of 2-3 degrees C above normal. In spite of such warm air temperatures, they are below the record high values observed at these sites in 1999. The warm air temperatures in 2000 are believed to

have contributed to the warmer-than-normal sea surface temperatures over most of the Scotian Shelf during the July DFO groundfish survey through larger atmospheric heat fluxes. Similar to air temperatures, surface waters in July 2000 are cooler than those observed in the same month in 1999 over most of the Shelf.

Near-bottom temperatures over the Scotian Shelf were above normal in July of 2000 (again relative to 1961-90). In the northeastern region of the Shelf this continued a general trend of increasing bottom temperatures that has occurred since the minimum observed in early 1990. It is the second year in succession that waters have been near or above normal in this region following approximately 15 years of below normal temperatures. In the central (Emerald Basin) and southwestern portions of the Scotian Shelf, temperatures were also above normal. This is similar to conditions through most of the 1980's and 1990's with the exception of 1998. At that time very cold conditions were observed due to an intrusion at depth of offshore Cold Labrador Slope Water (4 degrees to 8 degrees C) onto the shelf through gullies and channels. This Labrador Slope Water had moved southward to the Middle Atlantic Bight along the shelf edge replacing Warm Slope Water (8 degrees to 12 degrees C) during 1997 and 1998. This, in turn, was due to an increase in the transport of the deep (100-300 m) Labrador Current. In 1999, as the Labrador Water retracted northward the Warm Slope Water moved back in along the Shelf edge and eventually intruded onto the shelf.

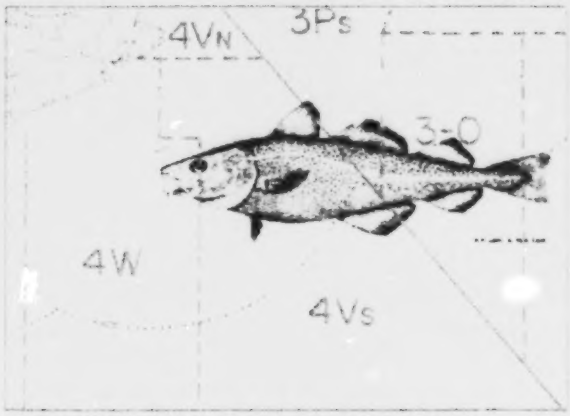
In the eastern Gulf of Maine in Georges Basin, near-bottom temperature trends were similar to Emerald Basin with warm conditions in 2000 and 1999 following very cold conditions in 1998. Warm conditions were also observed in the near bottom waters on Georges Bank and on Lurcher Shoals off southwest Nova Scotia in 2000. Cold temperatures were also observed at these sites in 1998.

In summary, **air and ocean conditions over the Scotian Shelf and the eastern Gulf of Maine were warmer-than-normal in 2000.**

(Source for Oceanographic Conditions: Drinkwater, K.F., R.G. Pettipas and L.M. Petrie. Temperatures conditions on the Scotian Shelf and Eastern Gulf of Maine in 2000.)

Chapter 2: Scotian Shelf and Bay of Fundy Stock-by-Stock Recommendations

Cod - 4VsW



2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). Fishing industry representatives noted that there has been a major reduction of effort in the area because fleets are now directing for other species such as lobster and crab and also noted that the buy back of licenses is reducing effort and capacity. While cod in 4VsW was not discussed at great length, it was noted that the population of seals is continuing to increase at an alarming level and that seals are becoming more aggressive in their search for prey.

Sentinel fishermen reported that seals are eating all the bait which cod eat and that they have been found in mackerel traps. Fishermen note the need to take action to reduce the numbers of seals but expressed frustration at the delay in dealing with the issue. Incidence of the seal worm presence in an expanding number of species (herring, haddock, redfish) was reported.

It was noted that the Seal Panel is holding a workshop in January 2001 and that input could be directed to that group for consideration in their work.

Analysis & Recommendations

The last full assessment of cod in 4VsW was in 1998. The 1998 DFO Stock Status Report and the Groundfish Update in 2000 indicate that:

- Average weight at age has shown some improvement in the last few years from the historic minimum in 1992.
- Surveys indicate that, since the mid-1980s, there has been an increase in the mortality of cod, other than that attributable to fishing, and which has persisted even after the closure of the fishery.
- The scientific evidence indicates that the increase in mortality from sources other than reported landings includes discarding, direct and indirect effects of harsh environmental conditions, and predation by seals.
- The spawning stock biomass is at or near the lowest level seen, between 5% to 16% of the average from 1979-89. Making plausible assumptions about seal consumption and other natural mortality, the biomass is projected to decline 5% to 20%, even in the absence of any fishery.
- There are inconsistent indicators of recent year class strength, however, the weight of evidence suggests that recruitment has been poor.
- The models of cod consumption by grey seals imply a range from 5,400t to 22,000t of cod being removed by seals. These are relative to estimated biomass of 32,000t to 37,000t respectively. It is not possible with the available data to choose among these models.
- The 1999 survey showed the first recruitment in many years.
- In 1999 and 2000, the March and July survey results for each year are virtually indistinguishable.
- Catches have been taken as by-catch in other groundfish fisheries.

The FRCC notes that following the recommendations for the 1998 fishery, the March 1998 Research Vessel Survey has been reinstated and the fishing industry has funded this survey.

The FRCC continues to be particularly concerned about the very low productivity of this stock and the lack of growth of the spawning stock since the fishery closure in 1993. Two key issues are thought to be related to the poor productivity of the stock:

(1) Environment: In 1998, this area experienced lower than normal water temperatures and scientists reported an increase in cold water species such as capelin in this area. In 1999 and 2000 this cold water trend seems to have dissipated. It is anticipated that the warmer water now in the area will have a positive effect on recruitment.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	55	48	44	38	35.2	35.2	35.2	35.2				Moratorium				
Catch	57.8	57.1	45.5	38.2	37.2	34.3	33.2	29.8	3.2	0.35	0.28	0.24	0.25	0.26	0.26	0.08

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

(2) Seals: The mean percentage of cod (mainly of younger ages) in the grey seal diet has remained at about 12%. Given that the grey seal population has apparently continued to increase at the same rate as previously measured, the estimate of consumption of 4VsW cod by grey seals in 1997 was between 5,400 - 22,000t.

The distribution of catches in the Sentinel surveys show most of the cod are found on the 4W banks (Western, Sable, Emerald) throughout the year. The Sentinel survey distribution also indicates that, at least during the fall, there are concentrations of cod in the nearshore areas.

The FRCC has not changed its outlook on this stock.

The FRCC recommends that there be no directed fishery for cod in 4VsW in 2001/2002.

The FRCC recommends that there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of 4VsW cod in all fisheries directed at other species.

The FRCC recommends that no recreational or food fisheries take place given the very precarious state of the cod stock in this area.

The FRCC recommends that the sentinel survey using commercial vessels continue for the 2001/2002 fishing year.

History of FRCC Recommendations

In August 1993, based on the drastic stock decline, the Council recommended that the 4VsW cod fishery be halted immediately. The fishery was closed in September. In November 1993, the Council recommended that there be no directed fishing for the 4VsW cod stock in 1994 and that by-catches be kept to the lowest possible level. Again in 1994, the Council recommended that there be no directed fishing for 4VsW cod in 1995 and that by-catches be kept to the lowest possible level. This recommendation was repeated for the 1996, 1997, 1998, 1999 and 2000 fishing seasons. Consequently, the fishery has remained closed.

It was further recommended that no recreational or food fisheries take place in the area, given the very precarious state of the cod stock. The Council also recommended for 1998 the immediate re-instatement of the March Research Vessel (RV) survey. The survey has continued since 1998 as an industry-funded initiative.

Sources

DFO Science

SSR A3-03(1998) Eastern Scotian Shelf Cod

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Council's Views on Stock Status

Overall indicator:	low
	Compared to average
Spawning biomass:	below average
Overall biomass:	well below average
Recruitment:	below average level of recruitment
Growth/Condition:	below average
Age structure:	below average (smaller fish at age)
Distribution:	below average
Recent exploitation:	fishery closed since September 1993

Cod - 4Vn (M-O)

2000 Consultations

The FRCC held a public consultation on this stock in Sydney, Nova Scotia (November 23). Fishermen spoke of their frustration with the current sentinel program and the results of the DFO research vessel survey. They believe a change in distribution has been caused by temperature shifts as opposed to reflecting a decline in abundance and that cod has moved to deeper water. Cod is reported to be so plentiful that halibut fishing was unduly restricted causing the fishery to be shut-down before the halibut quota was taken. It was noted that recreational catches of cod in this area are at an all time high.

Fishermen were unanimous in their expression of concern over increasing seal populations, their predation on juvenile fish and specifically referred to a population explosion of grey seals around the Bird Islands. Grey seal colonies were also noted to be established at Cape North, Neil's Harbour, Scaterie Island and Cape Smokey. Fishermen are fearful of the impact seals have on groundfish recovery.

Fishermen are also concerned about the impact of oil and gas development on local resources and asked that the FRCC support them in highlighting these concerns about the fishery impact.

Analysis & Recommendations

The most recent full assessment of this stock was done in 1998. The 1998 Stock Status Report and the Groundfish Update in 2000 indicate that:

- A high level of stock mixing in the area confounds the assessment.
- Recruitment continues to be poor; the inshore survey indication of a good 1995 year-class was not supported by research vessel results.
- Total mortality rates are still high despite the moratorium, suggesting migration of fish out of the area, or a lack of survival.
- Catch rates in the sentinel survey declined consistently from 1994 to 2000.
- Geographical distribution of cod (in sentinel fishery) has not changed over time.
- The 2000 summer survey shows a similar biomass to recent years at a very low level compared to historic averages.
- Biomass and adult biomass remain very low; no recovery is possible in the short term.
- The addition of information from the most recent research vessel survey and results from the sentinel fishery do not change the outlook for this resource for the year 2000.

Catch rates from the commercial index portion of the sentinel fishery do not agree with the results of the sentinel survey which has been declining since 1994. Fishermen do not feel that the RV survey accurately reflects resource status. The Council also notes that the catch rate information from the commercial index portion of the sentinel survey has not been formally reported in the update on stock status. The Council observes that not including this information results in a more pessimistic view of the resource.

The FRCC recommends that the next stock assessment for the 4Vn (M-O) Cod stock include the information related to catch rates of the commercial index portion of the sentinel survey.

Fishermen proposed that a limited commercial fishery in the order of 500-600t be permitted to demonstrate their belief that the resource is strong and to provide additional scientific data on distribution and catch rates. They proposed that this limited commercial fishery replace the commercial index portion of the sentinel fishery so that removals are minimized. Fishermen undertook to work with local management boards to develop a plan for submission to the FRCC that would provide information about the fishery spread in time and space over a number of months for the upcoming fishing year.

The Council recognizes the uncertainties around the results of the DFO survey in that it has limited cover-

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	12	12	9	7.5	7.5	7.5	10	10	1.8				Moratorium			
Catch	12.1	12	10.3	8.9	7.3	4.9	4.6	4.2	0.6	0.06	0.05	0.05	0.05	0.043	0.075	0.05

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

age and a restrictive number of sets (12) in the survey area. The Council also believes that providing a minimal increase in removals from this stock can serve to answer some questions the fishermen have raised about the resource status. It notes that the current sentinel program removes approximately 300t annually in the collection of data for sentinel purposes, for the prosecution of the commercial portion of the index fishery and for by-catch purposes. In an attempt to bridge the gap between the fishermen's view of the resource and that portrayed by the research survey, therefore,

The FRCC recommends that total removals not exceed 500t annually, including the sentinel survey component, the commercial index fishery component and all by-catches in other commercial fisheries. This is recommended to continue for the next 3 years.

The FRCC recommends that DFO science and management work with the industry to ensure that the maximum benefit is derived from the survey. Industry is urged to coordinate their commercial index survey activities with the manager of the 4Vn sentinel program to ensure that:

a. **effort be spread over time and space so that the maximum amount of information about the stock can be derived;**

b. **effort should take place in various water depths throughout the stock area;**

c. **samples of catches should be taken at sea and at dockside to provide length frequencies and otolith samples;**

d. **observer and dockside monitoring programs be implemented and logbooks be maintained.**

The FRCC further recommends that there be a full review annually of the results of the program recommended above. If there is an indication of further resource decline, this program will be restricted accordingly.

The results of these annual reviews should be incorporated in a full assessment of this stock.

As noted, a high degree of concern was expressed over the increasing seal population and its impact on juveniles in nursery areas. There is some evidence that survival of 1-3 year old cod is negatively impacted by growing seal populations. The area around Bird Island is believed by some industry members to be a nursery

Sources

DFO Science

SSR A3-02(1998) Cod in Sydney Bight

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Sydney, NS (November 23)

Written Briefs

4Vn Groundfish Management Board – Robert Courtney (2000-010-00484)

Council's Views on Stock Status

Overall indicator:	very low levels
	Compared to average
Spawning biomass:	far below average
Total biomass:	far below average
Recruitment:	very low
Growth/Condition:	average, improved from low values of 92-94
Age structure:	no good recruitment years since 1987, all ages depressed
Distribution:	steady in recent years, worse than in past
Recent exploitation:	fishery closed since Sept. 1993; total mortality still high

area for juvenile cod. Growing seal populations preying on these juveniles have been reported.

The FRCC recommends that that DFO Science study the Bird Island area to determine the extent of juvenile groundfish dynamics in this area, and evaluate the potential for applying measures to protect juvenile groundfish around Bird Island, including measures to exclude seals from this area.

History of FRCC Recommendations

In August 1993, the Council recommended that fishing on this stock be halted immediately. The recommendation was accepted and the fishery was closed in September. In November 1993, the Council recommended that there be no directed fishing for this stock in 1994 and that by-catches be kept to the lowest possible level. This recommendation was repeated in November 1994 for the 1995 fishing year and again in November 1995 for the 1996 fishing season. These recommendations were accepted and the fishery has remained closed. In October 1996, the FRCC again recommended that there be no directed fishery for 4Vn Cod in 1997. Council also recommended that there be an expanded Sentinel Fishery with a strong commercial index component.

The Council had recommended in 1997 that a workshop involving industry be held in 1998 to assess the Sentinel survey in 4Vn and in particular to determine if the commercial index could be made viable and continued.

For 1998 and 1999 and 2000, the Council repeated its recommendation that there be no directed fishery of this stock and that by-catches be kept to a minimum. It was also recommended that Sentinel surveys continue for several years into the future.

Cod - 4X+5Y

2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22) and Halifax, Nova Scotia (November 24).

Fixed gear fishermen reported that there were more cod this year than in the two previous years. Because of low relative cod quotas, cod was being taken primarily as by-catch in the directed haddock fishery despite efforts to avoid cod. Fishermen from all gear types reported that cod were caught in good condition with large, numerous cod found in the Bay of Fundy, in deep water off German Bank, around Little LaHave and off Brown's Bank – locations where the fall and winter fishery would traditionally take place. Fishermen also reported signs of small cod coming into the fishery.

Fishermen did not think that there was much misreporting of cod and haddock. Fishermen in Shelburne reported that grey and harbour seals were present in greater numbers this year than in the past.

Analysis of FRCC questionnaires completed by fishermen showed that fishermen uniformly believe that 4X+5Y cod had improved stock status in 2000. Fishermen also consistently reported better catch rates (at lower levels of fishing effort) for cod, that cod were easier to find, and that catches gave bigger fish in good condition. As well, fishermen widely supported stock monitoring and enforcement programs in the cod and haddock mixed fishery.

Recommendations from the industry generally recognized and supported the continuation of the multi-year 6,000t TAC for 4X+5Y cod which will be into the second year of the three year plan in 2001/2002.

Analysis & Recommendations

The 2000 Stock Status Report indicates that:

- Reported landings in 1999 were the lowest on record.
- Exploitation rate on fully recruited ages 4 and 5 has declined from the high of 60% in 1992, and is estimated to be about 23% in 1999.
- From a figure in the SSR, spawning stock biomass (ages 4-8) in 2000 is estimated to be at a low level (about 20,000t) and has been stable around this level since 1993.
- For removals of 6,000t in 2001/2002, there is a 50% chance of a 20% increase in 4+ biomass to 2002 due to improved anticipated recruitment of the 1998 year class (age 4 in 2002).
- The 1998 year-class is the strongest since 1992; initial indications are that the 1999 year class is at least as strong; the 1999 year class must be at least as strong as the 1998 year class to approach the growth implied by the current three-year rebuilding plan.

For the 2000/2001 fishing year the FRCC had recommended that the TAC for 4X+5Y cod be decreased sharply to 4,000t in order to improve the opportunities for year-over-year stock growth. This recommendation reflected (1) the Council's frustration that anticipated year-over-year growth in this stock was not being realized, and (2) the Council's mandate for stock rebuilding.

The FRCC's view of this stock continues to be confounded again this year by the differing feedback received in the Stock Status Report (based on the 4X+5Y cod scientific assessment and the results of the RV survey) and in the feedback received from fishermen. The outlook presented by the VPA continues to be considerably uncertain with respect to the estimates of abundance, especially at older ages (8+) and the anticipated strengths of the not-yet-recruited year-classes (ages 1 and 2).

Fishermen have changed their fishing patterns with respect to catching cod in 4X+5Y. Because of the low relative quota of recent years, fixed gear and mobile gear fishermen now avoid traditional cod areas and learn to manage cod catches more as by-catch while directing for haddock. Thus, information from commercial catches for cod are not indicative of what cod may be in the water, e.g., commercial fishermen do not

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	30	20	17.5	14	12.5	12	26	26	15	13	9	11	13	9.3	7	6
Catch	20	19.2	18.5	19.1	19.4	22.7	26.7	25.5	15.8	13.1	8.8	10.6	11.5	8.28	7.11	4.30

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

fish in areas where larger cod are traditionally found. Moreover, the low RV survey catches at older ages has left a relative void in data on the older cod in the population.

In order to address these issues, yet again this year, the formulation of the analytical assessment model for this stock has changed. These changes make it difficult for the FRCC to compare estimates year over year. In any case, the stock status remains low with some optimism anticipated in the age one and two year old stock that have not yet been fully observed. It is on the strength of these incoming year classes that a slightly more optimistic projection of the stock is presented in the SSR this year. Should the availability of older fish be as anticipated, AND the incoming year classes for 1998 and 1999 are considerably stronger than all of the last 5 years that are the lowest on record, then the SSB target of 40,000t ages 4+ at the beginning of 2003 may be reached.

In the face of the uncertainties, the FRCC continues to be concerned about the status of this stock.

Sources

DFO Science

SSR A3-05(2000) Southern Scotian Shelf and Bay of Fundy cod

FRCC Consultations

Shelburne, NS (November 22)
Halifax, NS (November 24)

Written Briefs

Inshore Fisheries Ltd. – Claude d'Entremont (2000-010-00479)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

<45' Shelburne County Fixed Gear Quota Group – Weldon Smith (2000-010-00481)

Shelburne Co. Competitive Fishermen's Assoc. – Pam Decker (2000-010-00482)

Debbie MacKenzie (2000-010-00497)

Council's Views on Stock Status

Overall stock Indicator:	continually below expectation year-over-year
	Compared to average
Spawning biomass:	at historically low levels; reached mini-mum in 1994; increased only marginally since and remains unchanged at a low level associated with poor recruitment; anticipated improved re-cruitment in 1998 and 1999 year classes
Total Biomass:	same as above
Recruitment:	well below historical average 1 year olds since 1992
Growth and Condition:	continues to be good
Age Structure:	older ages comprise less than expected proportion of landings, current VPA likely overestimates stock over 7 years of age
Distribution:	unusual RV survey in 2000: few cod on Shelf, none caught on LaHave Bank or east of Roseway; low catches on Browns Bank; catches in Bay of Fundy similar to recent years in RV and ITQ surveys
Recent Exploitation:	reached a high in 1992; declined since but still above the target exploitation of 17% (F0.1 level)

The following recommendations are made in addition to the new and existing conservation management measures in place for this stock, including the TAC, closure of the Brown's Bank spawning area (from February to June), the small fish protocol (<43cm), minimum mesh size (130mm), and enhanced dockside monitoring and observer coverage levels and strict protocols for cod by-catch in other fisheries.

Specifically, the FRCC supports Fisheries Management and industry as they move toward 100% DMP in fixed gear fishery groups that are currently at 50% dockside monitoring or less. It is also noted from FRCC questionnaires, that increased DMP and at-sea boardings were suggestions from fishermen as a means to improve enforcement.

The FRCC recommends that for the 2001/2002 fishery, DFO Fisheries Management, in consultation with industry, review measures to ensure that dumping, discarding, and misreporting does not take place in this fishery (such as increase levels of at-sea boarding and sampling, dockside monitoring, and observer coverage at sea and make changes where necessary).

The FRCC supports the current efforts of the Maritimes Science program to carry out a small-scale cod tagging program. Extension of the current program to include the joint industry-DFO ITQ survey would provide wider results for future analysis.

The FRCC recommends that DFO Science, in consultation with industry, develop an extended tagging program in 4X+5Y that will enable the study and improve understanding of seasonal cod (and other groundfish) migration patterns and spawning location and dynamics.

History of FRCC Recommendations

In August 1993, the Council recommended, as a precautionary conservation measure, that the 1993 TAC be reduced from 26,000t to 15,000t. In November 1993, the Council recommended that the 1994 TAC for 4X cod be set at 13,000t. In addition, the Council recommended that other conservation measures, such as (a) improved selectivity of fishing gears (increased hook and mesh sizes), (b) limitations on the quantity and dimensions of fishing gear used, and (c) expanded use of area closures to protect spawning and/or juvenile aggregations, be considered for this fishery. In November 1994, the Council recommended that the 1995 TAC for 4X cod be set at 9,000t. As well, Council recommended that a workshop be organized jointly by the Department of Fisheries and Oceans and industry with the objective of an orderly fishery and the elimination of dumping, discarding and misreporting; and finally the Council recommended that should dumping, discarding and misreporting persist, the fishery be closed for the gear type involved. In the fall of 1995, the Council recommended a TAC of 11,000t for 1996 with mandatory dockside grading for all gear types.

For 1997, the FRCC recommended that the TAC be set at 13,000t, mandatory dockside monitoring be maintained for all gear types, and, the dialogue between DFO and industry concerning dumping, discarding and misreporting continue, to ensure that management measures to avoid these problems remain in place.

For 1998, the Council recommended that the TAC for this stock be set at 9,300t, and as an immediate priority, DFO Management and Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy) for cod, haddock and pollock. The Council further recommended that there be an update on genetic information on the Bay of Fundy and Scotian Shelf components of this stock with a view to determining if a geographic split in the stock between those two areas is appropriate.

For 1999, the Council recommended that the TAC be set at 7,000t and that measures be taken to protect the 1996 year class.

For the 2000/2001 fishing season, the FRCC recommended a drastic decline in the 4X cod TAC to 4,000t. This recommendation was not accepted by the Minister and was replaced by a 3 year TAC set at 6,000t annually and linked to achieving a 3 year growth target of 40,000t of spawning stock biomass at the beginning of 2003. The FRCC was asked to provide advice on the progress toward rebuilding the spawning stock biomass.

HADDOCK - 4TVW

2000 CONSULTATIONS

The FRCC held public consultations on this stock in Sydney (November 23) and Halifax, Nova Scotia (November 24). Industry expressed optimism concerning the significant and widespread evidence of the rebuilding of this stock.

ANALYSIS & RECOMMENDATIONS

The most recent full assessment of this stock was conducted in 1997. The 2000 Update provided by DFO Science Branch indicates:

- The 1995, 1996 and 1997 year classes are near the long term average.
- The extraordinarily abundant 1999 year class was evident in the 1999 survey, and remained extremely abundant in the 2000 survey. O-group abundance in the 2000 survey also appears to be high.
- A tremendous reduction in fish growth has occurred. A graph in the SSR shows that the current reduction in size at age in the summer survey compared to levels of the mid-1970's has ranged from approximately 10 to 40%, depending on the age group.
- Condition of adults improved steadily since 1993, reaching above average for the first time in a decade in 1999, and dropped in 2000. Somewhat similar pattern have been noted for the condition of juveniles.
- While the 1999 year class was widely distributed throughout the Scotian Shelf, most of the balance of the stock distribution is generally confined to the closed area in Division 4W.

It appears that fishing alone was not the cause of the collapse of this stock. Harsh environmental conditions appear to have contributed to its decline. Similarly, improving environmental factors have apparently resulted in a significant rebound in the abundance of this stock. A remaining problem related to the poor fish growth rate has had the effect of delaying the recruitment of incoming year classes into fishable sizes, keeping the fishable biomass at lower levels than would otherwise be achieved. Haddock mature after 3-5 years. After sexual maturity is reached, growth rates diminish. It is conceivable that by the year 2002, the abundance of haddock in the spawning stock will reach well above any reasonable 'limit' that may be established for this stock. It also appears that by the year 2002, the series of good year classes over the 1995 through 2000 period will have resulted in a very strong age structure being achieved in this stock. While there may be a relatively small fishable biomass at the minimum allowable fish size, it is apparent that this stock has returned or is returning to a healthy condition apart from the issues of fish growth rate and the concentrated geographic distribution of the stock. In light of these remaining issues of concern, and due to the fact that a full assessment was not conducted in 2000, the Council is not in a position to effectively consider any change in the TAC recommendation for the coming year.

The FRCC recommends that there be no directed commercial fishery for haddock in 4TVW in 2001/2002.

In light of the positive signals referred to above, and in preparation for the full assessment recommended to be conducted in 2001, it appears appropriate to consider ways and means by which our knowledge of this stock may be enhanced, beyond what might be realized through the traditional research vessel surveys.

The FRCC recommends that a directed index fishery be specifically designed and implemented for haddock, reflecting historic temporal and spatial patterns, to monitor the condition of the stock and its attributes throughout its normal range, and to compare available catch rates with the historical time series. DFO and industry should discuss total minimal removals that are required for this activity to take place.

Both DFO and industry are to be complimented for keeping the total by-catch of 4TVW haddock well below the prescribed 5-10% levels. While the Council

Figures are in 000t

Year	1986	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000[1]
TAC	15	17	by-catch		6.7	6	by-catch					Moratorium				
Catch	11.9	16.3	4.2	3.9	9.1	6.8	5.8	5.9	1.2	0.09	0.09	0.10	0.06	0.12	0.08	0.06

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

has not been made aware that haddock by-catch limits have been a constraint in the conduct of other directed fisheries, it is appropriate that the 'restrictive measures' to minimize by-catch in all fisheries directed at other species be revisited where appropriate.

The FRCC recommends that catches should not exceed those required for the normal conduct of fisheries directed towards other species.

The FRCC recommends that the closure of the haddock box to commercial groundfish fishing be continued.

History of FRCC Recommendations

In August 1993, the Council expressed concern about the low level of this stock. In 1993, 1994, 1995 and 1996, the Council recommended that there be no directed fishing for the 4TVW haddock stock and that the closure of the haddock box to all gears be continued.

In November 1997, the Council re-iterated recommendations that there continue to be no directed fishing for 4TVW haddock in 1998 and that the closure of the haddock box to all gears be continued. The FRCC also recommended that the deterioration in the condition factor of 4TVW Haddock be monitored. These recommendations were repeated for 1999, and essentially for 2000.

Sources

DFO Science

SSR A3-06(1997) Eastern Scotian Shelf haddock

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Sydney, NS (November 23)
Halifax, NS (November 24)

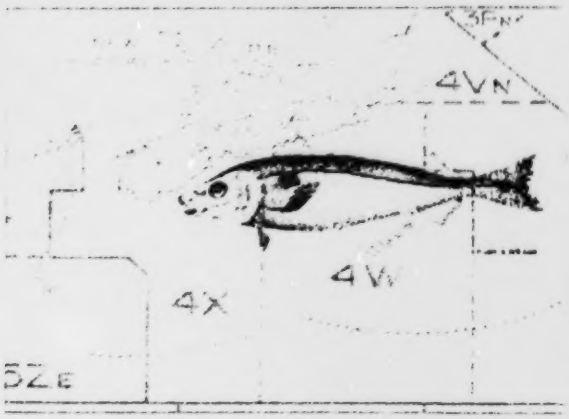
Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Council's Views on Stock Status

Overall Stock Indicator:	increasing abundance
Spawning biomass:	unknown
Total biomass:	unknown
Recruitment:	above average
Growth:	low
Condition:	about average
Age structure:	positive
Distribution:	concentrated
Recent exploitation:	low

HADDOCK - 4X+5Y



2000 CONSULTATIONS

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). Industry experience and observations agreed strongly with the scientific surveys and assessment showing high abundance, excellent recruitment of small fish and an overall rebuilding trend. Industry recommended that a status quo on removals is prudent. Overall low condition and growth trends compared to average in 4X+5Y haddock were not considered to be negative by industry. Continued concerns were expressed in the fixed gear sector that available haddock quota and landings are being limited by relatively low cod quotas in the mixed fishery.

ANALYSIS & RECOMMENDATIONS

The 1999 Stock Status Report and the Groundfish Update in 2000 indicate that:

- Biomass abundance and recruitment are above average.
- Both the 1993 and 1994 year classes dominated age composition of 1999 landings (48%). The 1998 and 1999 year classes are strong, and the 1997 year class is above average.
- Exploitation rate for ages 5-7 decreased from approximately 50% in the early 1980s and dropped below $F_{0.1}$ from 1994 through 1997. The exploitation rate in 1998 and 1999 met expectations (from the 1999 SSR) of being near $F_{0.1}$ (20%). Similarly, in 2000 the exploitation rate is expected to be near 20% if catches do not exceed the 2000 TAC of 8,100t.
- The projected yield at $F_{0.1}$ in the year 2001 would be about 8,600t.
- If fished at $F_{0.1}$ in the year 2001, the spawning stock biomass is projected to increase to 39,000t and then decline slightly to 37,000t in 2002.
- Geographic distribution and area occupied is large.
- Mean lengths at age and condition remain below average.

In response to the FRCC's 1998 recommendations, DFO Fisheries Management provided a review of levels of at-sea boarding, dockside monitoring, and observer coverage for the 4X+5Y cod, haddock, pollock, and white hake fisheries. In the future, it is anticipated that this valuable information can be provided as a regular report to the FRCC in advance of the FRCC's consultation with fishermen.

It was noted that both fixed and mobile gear sectors have made significant progress in directing for haddock with minimal by-catch of cod in what was previously predominantly a mixed cod-haddock fishery. The FRCC recognizes the effort made by industry to conduct a clean haddock fishery and encourages continued innovation in the harvesting of this resource in a responsible manner.

Participants had attributed earlier concerns in 1998 with regard to effort shift to the Bay of Fundy to the influx of cold water along the Scotian Shelf and into the Bay of Fundy. It was generally agreed that 1999 was typical of more normal fishing patterns in the area. The return to more normal fishing patterns and warmer water trends appeared to have continued in 2000.

Status quo at the 2000 TAC level should allow for continued expected rebuilding of the stock given the improved numbers of recruits, and for industry to achieve more sustained future benefits. Achievement of a broad age structure in the population, enhancement of the population of older, more productive spawners, and recovery of weights-at-age are realistic medium term objectives for this stock. A recovery of weights-at-age and condition in particular would result in the opportunity for an appreciable increase in the TAC. Spawning stock biomass increase and stability is dependent on continued strong recruitment.

The FRCC recommends that the TAC for 4X+5Y

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	15	15	15	12.4	4.6	4.6	0	0	6	4.5	6	6.5	6.7	8.1	8.1	8.1
Catch	15.3	15.3	13.7	11	6.9	7.4	10	10.2	8.6	4.41	5.67	6.19	6.60	7.88	9.11	3.70

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

haddock remain at 8,100t in 2001/2002.

Difficulties in estimating variable recruitment and the concentration of the fishery on few year classes requires care in maintaining the sustainable potential for this fishery.

The FRCC recommends that management measures be enforced to protect juvenile haddock and incoming recruitment and efforts to avoid the capture of small fish be continued.

History of FRCC Recommendations

In its August 1993 report, the Council recommended that every action be taken to ensure that there are no overruns of the 1993 quota. The stock was closed to fishing in September because the quotas had been taken. In November 1993, the Council recommended that the 1994 TAC for 4X haddock be set at 4,500t (by-catch only) and that every action be taken to ensure that there are no overruns of this quota. In November 1994, the Council recommended that the 1995 TAC for 4X haddock be set at 6,000t. The Council recommended that, prior to the 1995 fishing season, a workshop be organized jointly by the Department of Fisheries and Oceans and the industry, with the objective of an orderly fishery, and the elimination of dumping, discarding and misreporting. Finally, the Council recommended that, should dumping, discarding and misreporting persist, the fishery be closed for the gear type involved. In November 1995, the Council recommended that the 1996 TAC for 4X Haddock be set at

Sources

DFO Science

SSR A3-07 (1999) Southern Scotian Shelf and Bay of Fundy haddock

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Inshore Fisheries Ltd. – Claude d'Entremont (2000-010-00479)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

<45' Shelburne County Fixed Gear Quota Group – Weldon Smith (2000-010-00481)

Shelburne Co. Competitive Fishermen's Assoc. – Pam Decker (2000-010-00482)

Debbie MacKenzie (2000-010-00497)

Council's Views on Stock Status

Overall Stock Indicator:	stable and rebuilding
	Compared to average
Spawning biomass:	above average since the mid 1980s
Total biomass:	above average since the mid 1980s
Recruitment:	year classes1995 weak; 1996 above average, 1997,1998,1999 strong
Growth/Condition:	remaining low
Age structure:	fewer than expected in older ages: 0-3 yrs - 80%, 4-6 - 17%, 7-9 - 4%
Distribution:	very high
Recent exploitation:	at or below $F_{0.1}$ since 1994

6,500t, that mandatory dockside grading be implemented for all gear types and that the same closure procedure as recommended in 1995 be implemented for 1996.

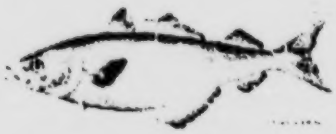
In October 1996, the FRCC recommended that the 1997 TAC be set at 6,700t and mandatory dockside monitoring be maintained for all gear types. The Council noted, as part of its recommendation, that should there be sufficient evidence of dumping, discarding and misreporting, the fishery be closed for the gear type involved until such time as fisheries managers can be assured that this activity will not continue; and fisheries managers take appropriate measures to ensure the protection of incoming year classes, including rigorously enforcing existing small fish protocols.

In November 1997, the Council recommended that the TAC for 4X Haddock be set at 8,100t and as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy) for cod, haddock and pollock. The Council also recommended that the decrease in condition factor be monitored.

In 1998, the Council was very concerned about an apparent shift in fishing effort from east to west by groundfish fleets into the Bay of Fundy. As a consequence of this apparent shift, and the continued difficulties of the Scotian Shelf groundfish recovery, there was real concern that an east to west phenomenon of stock decline was being observed. Accordingly, the FRCC made a series of recommendations for 4X groundfish stocks, including haddock, related to gathering information and analyzing the possibility of this possible threat to stock conservation.

For 2000, the Council repeated a recommendation to continue a TAC of 8100t and that management measures be enforced to protect positive recruitment trends and large numbers of small fish.

POLLOCK - 4VWX5ZC



2000 CONSULTATIONS

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). All industry comments were in support of a rollover of the 10,000t TAC. There were continued observations of small pollock being present in inshore waters as well as reports of increased presence of pollock in American waters. It was noted that the poor overall pollock landings in 2000/2001 were a result of a number of factors. These include depressed market prices for pollock, the lack of any pollock fishing effort by some quota holders, some pollock grounds being closed to directed groundfish fishing, and the constraint placed on pollock fishing by restrictive hake and cod by-catch levels.

ANALYSIS & RECOMMENDATIONS

The most recent full assessment of this stock was conducted in 1999. The 2000 Update provided by DFO Science Branch states:

- There has been a slight improvement in the standardized catch rate series from 1999 to 2000, due to higher catch rates for age 3 fish (1997 year class).
- The 2000 survey caught "many more" age 2 fish (1998 year class) compared with the 10 year average.
- This relative increase in the presence of age 2 fish was confirmed by the ITQ survey, which also showed a comparative absence of fish larger than 40cm.
- Excepting preliminary indications of improved recruitment, the new information does not suggest that the 1999 outlook needs to be revised. Catch rates remain comparatively low, there are few large fish, and the fishery remains spatially restricted.

Observations from participants continue to point out the lack of confidence in the reliability of the assessment of this stock. Marked differences in the assessment formulations do not provide a consistent year-over-year perspective on stock status. There continues therefore, to be a large degree of uncertainty about abundance of this stock. As a consequence, TACs established through the years 1991 through 1998 averaged 20,000t. The lowest TAC in this time series was 10,000t (1996). The Council continues to find itself without a clear point of historical reference in providing a TAC recommendation.

Following on its 1998 recommendation to develop alternative methods for estimating stock abundance, a DFO/industry acoustics data survey commenced in the year 1999. It is hoped that this survey may provide an independent dataset on stock status that could in time provide a benchmark for estimating the biomass of this stock.

Setting the TAC equal to the lowest level of the past 10 years is indicative of severe uncertainties in estimating stock status, generally declining indices of abundance, and shifts in stock distribution. With the welcome exception of evidence of strong incoming year classes, information made available to the Council in 2000 indicates little change in the condition of the stock, and provides no basis for a change in the TAC recommendation made last year.

The FRCC recommends that the TAC for 4VWX5Zc pollock be set at 10,000t in 2001/2002.

Uncertainties associated with the overall abundance and condition of the stock suggests that measures be considered to avoid having a disproportionate amount of the catch coming from a small area rather than being spread throughout the management area.

The FRCC recommends that DFO continue to report on pollock catch levels by subarea. The FRCC further recommends that DFO and industry develop measures to ensure that effort is not disproportionately directed towards any one subarea of the management unit.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	42.4	40	43	43	43	38	43	43	21	24	14.5	10	15	20	12	10
Catch	43.8	44.3	46	42.9	43.7	37.9	38.5	33.7	20.8	15.3	9.8	9.2	11.9	14.3	8.8	4.13

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

The Council anticipates that the apparently strong 1998 year class will soon begin to recruit to the fishery. Effective measures must be taken to protect this year class until it has the opportunity to make a strong contribution to the spawning stock biomass and to broaden the age structure of this stock. .

The FRCC recommends that DFO and industry develop an action plan to ensure that fishing effort in at least the 2001 through 2003 period does not concentrate on the 1998 year class.

History of FRCC Recommendations

In August 1993, the Council recommended, as a precautionary conservation measure, that the 1993 TAC be reduced from 35,000t to 21,000t. The Council also noted that the closure of the 4VsW cod fishery could cause some redirection of effort to the pollock fishery. In November 1993, the Council recommended that the 1994 TAC for 4VWX5Zc pollock be set at 24,000t, the $F_{0.1}$ catch level then calculated for 1994. In 1994, the Council recommended that the 1995 TAC for 4VWX5Zc pollock be set at the revised $F_{0.1}$ calculation of 14,500t. The Council also recommended that Fisheries and Oceans scientists work with the industry to determine if, and during what times of the year, it would be appropriate to establish closed areas for 4VWX5Zc pollock to protect the spawning stock. The Council noted that the 2nd Groundfish Workshop held in early October 1995 provided a forum to discuss possible measures to further improve conservation of

Sources

DFO Science

SSR A3-13(1999) Pollock in 4VWX5c

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Inshore Fisheries Ltd. – Claude d'Entremont (2000-010-00479)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status

Overall stock Indicator:	likely much below average
	Compared to average
Spawning biomass:	uncertain but likely much below average; at levels normally associated with poor recruitment
Total Biomass:	uncertain but likely below average
Recruitment:	1992-1995 year classes below average; evidence of an improved year class in 1997, and an exceptionally strong year class in 1998.
Growth and Condition:	slight decline in weights at age reported in 1999
Age Structure:	size and age of fish diminishing reported in 1999
Distribution:	increasingly constricted reported in 1999
Recent Exploitation:	unknown

groundfish stocks in this area. In November 1995, the Council recommended that the 1996 TAC for 4VWX5Zc pollock be set at 10,000t.

In October 1996, the FRCC recommended that the 1997 TAC be increased to 15,000t. The Council cautioned that DFO scientists continue to work with the industry to determine if, and during what times of the year, it would be appropriate to establish closed areas for 4VWX5Zc pollock to protect the spawning stock. The Council also recommended that DFO scientists look at other abundance indicators.

In November 1997, the Council recommended that the 1998 TAC for 4VWX5c Pollock be set at 20,000t; and as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy) for cod, haddock and pollock. The Council also recommended that the decline in condition factor be monitored.

For 1999, the TAC was recommended to be reduced to the level of 12,000t. The Council recommended the 2000/2001 TAC to be 10,000t.

FLATFISHES - 4VW

2000 CONSULTATIONS

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). Some fishermen who had fished 4VW flatfish for 30 years were still experiencing high catch rates, grey sole (witch flounder) were plentiful, however, they expressed that they were still too small for market. Conflicts with the ever increasing amount of crab gear, otter trawl vessels switching to more lucrative crab fishing, and generally low flatfish prices were reasons given why the TAC was not fully caught recently. Fishermen expressed their opinion that the three flatfish species should not be split in individual TAC's because operationally, it could create a redirection of effort and potential for discarding. In 4Vn, industry participants felt that the 4VW yellowtail may be fished separately from the other two species.

Fishermen observed that when seismic testing took place while they were fishing, bottom dwelling species, such as flatfish, appeared to leave the area only to return days or weeks later. The same seismic disturbances were experienced in the early 80's.

The fishermen directing for 4VW flatfish did not agree with the results of the DFO scientific assessment. Other participants felt that the flatfish stocks looked stable and stressed that the industry will be exploring ways to protect recruitment. Industry generally recommended the status quo of a 3,000t TAC for 2001/2002 for 4VW flatfish (4VW yellowtail, 4VW American plaice as well as the eastern portions of 4VWX witch flounder).

ANALYSIS & RECOMMENDATIONS

4VW Flatfish

The 2000 stock assessment produced a Stock Status Report for American plaice and yellowtail flounder on the Eastern Scotian Shelf (Div. 4VW).

The SSR indicates that for 4VW American plaice:

- The abundance and condition of fishery sizes of American plaice is very low.
- There should be a reduction in fishing mortality on American plaice until an increase in production is observed.

The SSR indicates that for 4VW yellowtail flounder:

- Fishery-sized yellowtail flounder are no longer available in either of the two areas of concentration (4Vs and 4W).
- Yellowtail flounder pre-recruit abundance has been improving, but with no evidence of a contribution to the fishable biomass. Until this happens, there are no prospects of improved yields.

The 4VWX Witch flounder stock was assessed in 1997 separately from other flatfish. The 1997 SSR and 2000 Groundfish Update indicate that:

- Fishable population declined from 1980s levels to low of 1992-93, remaining low at present.
- Pre-recruits highly localized in Gully and deep holes north of Banquereau Bank in 4VsW.
- Avoid increased effort on witch, to protect incoming recruitment and allow rebuilding.
- Likely some linkage with stocks to north and east.
- Recruitment since 1993 has been stronger than in earlier periods, peaking in 1997.

Although the new information in the 2000 SSR continues to support a positive view of recovery, the short-term outlook for the stock remains unchanged.

The FRCC is committed to rebuilding the flatfish stocks in 4VW. A first step to accomplish this task is to identify the species composition of flatfish catches so that in the future further conservation measures can be applied.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC										5.5	4.125	3.5	3	3	3	3
Catch	7.7	7.4	8.9	7.3	7.7	7.2	5.6	5.3	4.2	3.5	2.3	2	2	1.90	2.03	0.8

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Council's Views on Stock Status (4VWX witch flounder)

Overall Stock Indicator:	low-medium (rebuilding)
	Compared to average
Spawning biomass:	low
Total biomass:	average
Recruitment:	strong, improved since 1993
Growth/Condition:	no particular observation
Age structure:	good for pre-recruits; older ages low
Distribution:	average
Recent exploitation:	unknown

Council's Views on Stock Status (4VW American plaice)

Overall Stock Indicator:	low (potential for rebuilding)
	Compared to average
Spawning biomass:	low
Total biomass:	low
Recruitment:	confirmed signs of recruitment
Growth/Condition:	no particular observation
Age structure:	shift toward smaller fish
Distribution:	species specific
Recent exploitation:	relative fishing mortality increased since 1995

The FRCC recommends that the TAC for 4VW flatfish be set at 3,000t in 2001/2002.

The FRCC recommends that DFO Science in consultation with industry provide estimates by the Fall of 2001 on proportionate biomass levels of 4VW flatfishes including witch flounder, winter flounder, American plaice, and yellowtail flounder.

The proportionate biomass information and other available information (e.g., relating to the operation of the fishery) will be used to establish stock status on individual flatfish species and allow the FRCC to implement stock-by-stock measures for the conservation of these resources in the future.

Council's Views on Stock Status (4VW yellowtail flounder)

Overall Stock Indicator:	low
	Compared to average
Spawning biomass:	maturity under the market size
Total biomass:	relatively low
Recruitment:	relatively high numbers of pre-recruits
Condition:	no clear trends over years
Growth:	appear to live full life cycle under fishery size
Age structure:	no reliable aging, high #'s pre-recruits; fishery-sized lowest observed
Distribution:	contraction of distribution
Recent exploitation:	relative fishing mortality approx. zero since 1997

The FRCC therefore recommends that DFO Science and Fisheries Management in consultation with industry take the necessary steps to investigate and report by the Fall of 2001 on the practicality of directing specific conservation measures on these individual species.

The FRCC recommends that minimum size limits be enforced to protect incoming recruitment and efforts to avoid the capture of small fish be continued.

History of FRCC Recommendations

In November 1993, the Council recommended that efforts underway to obtain better information on the landings by species and area be encouraged in order to provide a more rational basis for conservation measures for this resource complex in future years. The Council also recommended that, pending the provision of more reliable catch data on flatfish on the Scotian Shelf, the 1994 TAC for 4VWX flatfish be set at 14,000t. In November 1994, based upon available information, the Council concluded that both the effort and the TACs for these stocks needed to be reduced further and, as well, that the proportions between the two units should be changed to better reflect relative stock abundance. The Council recommended that the global 1995 TAC for all 4VWX flatfishes be set at 7,500t. In November 1995, the Council recommended that the 1996 TAC for 4VW flatfishes be set at 3,500t and that the 1996 TAC for 4X+5 flatfishes be set at 3,375t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VW flatfishes be set at 3,000t and the 1997 TAC for 4X+5 flatfishes be set at 3,000t and that efforts to avoid the capture of small fish be continued for both of these fisheries. The Council also recommended that work be carried out by DFO and the industry, possibly in conjunction with the dockside monitoring program, to address the problem of species identification.

For 1998, 1999, and 2000 the Council reiterated the previous years' recommendations and suggested that DFO and industry continue to work to address the problem of species identification.

Sources

DFO Science

SSR A3-34(2000) American Plaice and Yellowtail Flounder on the Eastern Scotian Shelf (Div. 4VW)

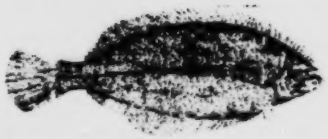
FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

FLATFISHES - 4X+5Y



2000 CONSULTATIONS

The FRCC held public consultations on these stocks in Shelburne (November 22) and Halifax, Nova Scotia (November 24). Industry participants expressed the view that the stock status appears stable. They also noted that they will be recommending the closure of two additional winter flounder spawning areas (St. Mary's Bay and Lobster Bay). Other participants reported seeing better signs of smaller flounder. Reports that the ITQ survey did experience increased numbers of small fish, however, did not warrant a change in the current TAC level of 2,000 for 4X+5Y flatfish.

ANALYSIS & RECOMMENDATIONS

The 1997 Stock Status Report and Groundfish Update in 2000 indicates that:

- Given efficiency increases, declines in catch rates may under-estimate stock declines.
- The precautionary approach implies immediate action is needed to reduce fishing effort on 4X flatfish (could be done by lowering the TAC so landings in 1998 are less than those in 1996).
- Fishing effort should be spread proportionately among species.
- Current information indicates stability in stock status in recent years at about the long-term mean.

4X Winter flounder

- RV survey indicates that the declining trend in abundance of winter flounder, evident in 1998-1999, was reversed in 2000 with a high abundance estimate.

4X American plaice

- A large pulse of young fish in 1999 remains a hopeful sign of future recruitment to the American plaice population.

4X Yellowtail flounder

- A large decline of yellowtail flounder survey index for 1999 was not maintained in 2000. Thus the abundance of yellowtail flounder may have remained above the long-term mean since 1991.

The 4VWX witch flounder stock was assessed in 1997 separately from other flatfish. The 1997 Stock Status Report and Groundfish Update in 2000 indicate that:

- Fishable population declined from 1980s levels to low of 1992-93, remaining low at present.
- Pre-recruits highly localized in Gully and deep holes north of Banquereau Bank in 4VsW.
- Avoid increased effort on witch, to protect incoming recruitment and allow rebuilding.
- Likely some linkage with stocks to north and east.
- Recruitment since 1993 has been stronger than in earlier periods, peaking in 1997.

Although the new information in the 2000 stock status report continues to support a positive view of recovery, the short term outlook for the stock remains unchanged.

The Council is committed to conserving the 4X+5Y flatfish stocks and feels that the first step to accomplishing this task is segregating their identification in the catch so that future conservation requirements can be better targeted. The Council is encouraged to see that industry is being pro-active in suggesting closed areas for spawning to protect the winter flounder stock in 4X+5Y.

The FRCC recommends that the TAC for 4X+5Y flatfish be set at 2,000t for 2001/2002.

The FRCC recommends that DFO Science in consultation with industry provide estimates by the Fall of 2001 on proportionate biomass levels of 4X+5Y flatfishes

Figures are in 000t

Year	1986	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC										4.5	3.375	3.375	3	2	2	2
Catch	3.92	5.59	4.28	4.65	3.33	6.1	5.8	5.9	4	2.54	2.5	2.46	2.01	1.67	1.70	1.23

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

including witch flounder, winter flounder, American plaice, and yellowtail flounder.

The proportionate biomass information and other available information (e.g., relating to the operation of the fishery) will be used to establish stock status on individual flatfish species and allow the FRCC to implement stock-by-stock measures for the conservation of these resources in the future.

The FRCC therefore recommends that DFO Science and Fisheries Management in consultation with industry take the necessary steps to investigate and report by the Fall of 2001 on practicality of directing specific conservation measures on these individual species.

History of FRCC Recommendations

In November 1993, the Council recommended that efforts underway to obtain better information on the landings by species and area be encouraged in order to provide a more rational basis for conservation meas-

Council's Views on Stock Status (4X Flatfish except Witch)

Overall Stock Indicator:	medium
	Compared to average
Spawning biomass:	long-term mean
Total biomass:	long-term mean
Recruitment:	improving
Growth/Condition:	no particular observation
Age structure:	unknown
Distribution:	species specific
Recent exploitation:	unknown

Sources

DFO Science

SSR A3-21(1997) Southwest Nova winter flounder, American plaice, and yellowtail flounder

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Halifax, NS (November 24)

Written Briefs

Inshore Fisheries Ltd. – Claude d'Entremont (2000-010-00479)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status (4VWX Witch Flounder)

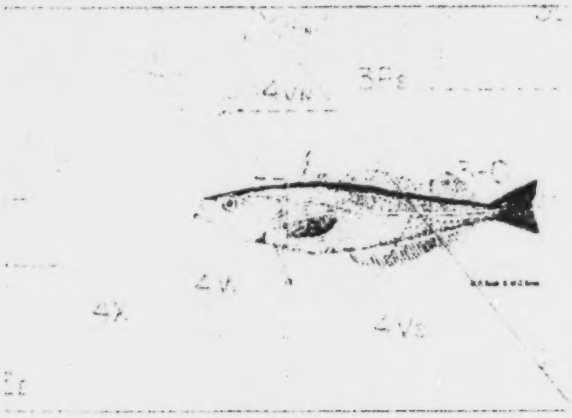
Overall Stock Indicator:	low-medium (rebuilding)
	Compared to average
Spawning biomass:	low
Total biomass:	average
Recruitment:	strong, improved since 1993
Growth/Condition:	no particular observation
Age structure:	good for pre-recruits; older ages low
Distribution:	average
Recent exploitation:	unknown

ures for this resource complex in future years. The Council also recommended that, pending the provision of more reliable catch data on flatfish on the Scotian Shelf, the 1994 TAC for 4VWX flatfish be set at 14,000t. In November 1994, based upon available information, the Council concluded that both the effort and the TACs for these stocks needed to be reduced further and, as well, that the proportions between the two units should be changed to better reflect relative stock abundance. The Council recommended that the global 1995 TAC for all 4VWX flatfishes be set at 7,500t. In November 1995, the Council recommended that the 1996 TAC for 4VW flatfishes be set at 3,500t and that the 1996 TAC for 4X+5Y flatfishes be set at 3,375t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VW flatfishes be set at 3,000t and the 1997 TAC for 4X+5Y flatfishes be set at 3,000t and that efforts to avoid the capture of small fish be continued for both of these fisheries. The Council also recommended that work be carried out by DFO and the industry, possibly in conjunction with the dockside monitoring program, to address the problem of species identification.

The Council recommended that the 1998, 1999 and the 2000 TACs for 4X flatfish be set at 2,000t, that the proportionate catch of witch in 4X flatfish stocks not exceed current levels and that efforts to avoid the capture of small fish be continued. The Council also recommended that work by DFO and industry to address the problem of species identification continue.

Silver Hake - 4VWX



2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). In Halifax, industry participants expressed concern that the silver hake assessment was not conducted this year and there are still a lot of questions on stock status. They also indicated that there was a silver hake workshop scheduled for December 11, 2000. Migration patterns are unclear and must be studied. There are also many questions of stock area in the Gulf of Maine portion where some suspect that these fish belong to a different component than the Scotian shelf or Emerald and LaHave Basin silver hake. The general theme at consultations and briefs are that silver hake quotas remain at status quo, or 20,000t for 2001/2002.

Analysis & Recommendations

The 1999 Stock Status Report and the 2000 Update indicate that:

- Landings by Canadian vessels from Emerald and LaHave Basins are continuing to increase relative to catches from the offshore fishery.
- Changes in mesh type and size by the Canadian fleet appear to be reducing catches of small fish.
- Survey biomass remains very low and total mortality is high. The extreme values of these important indicators cause substantial concern. In addition, condition, length-at-age, and size at maturity are below long term averages.
- Recruitment prospects appear good, with two above average year-classes entering the fishery, and resource concentration and distribution through the geographical range exhibit positive trends.
- It would be prudent not to allow catches to increase from 1997-1999 levels.
- Abundance and biomass from the DFO summer research vessel survey show a slight increase over 1999 levels, but remain low relative to long term mean.

Based on all the above information, the FRCC has no basis to change its opinion of the stock status from last year, and therefore the FRCC makes the following recommendations:

The FRCC recommends that the TAC for 4VWX silver hake be set at 20,000t for 2001/2002.

The fishery for silver hake depends heavily on very young fish (ages 2 - 4), for which there is not a long window of opportunity to develop recruitment information prior to their entry into the fishery. Prior to 1998, a standardized 0-group survey was conducted for this species, yielding valuable and early information about incoming recruitment. This survey was discontinued in 1998.

The Council recommends that DFO science and industry collaborate to determine stock structure of silver hake in the LaHave and Emerald basins versus the continental slope, and also the Gulf of Maine portion which hints on being a separate stock.

History of FRCC Recommendations

In June 1994, the NAFO Scientific Council calculated that the catch at $F_{0.1}$ for 1995 would be 79,000t. However, they noted that this calculation could be overestimated by as much as 20,000t. The Council recommended that the 1995 TAC for 4VWX silver hake be set at 60,000t. In order to reduce by-catches, the Silver Hake Box was redrawn in 1994 to move its northern boundary into deeper waters. Mandatory use of the Nordmore grate was also imposed in 1994. In November 1995, the Council recommended that the 1996 TAC for 4VWX silver hake remain at 60,000t. In October 1996 the FRCC recommended that the 1997 TAC for 4VWX silver hake be reduced to 50,000t. For

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000[1]
TAC	100	100	100	120	135	135	100	105	75	30	45	48	50	55	30	20
Catch	75.48	82.68	61.71	74.37	87.99	69.73	171.3	51.23	29.76	8	17.2	26.4	16.9	23.3	20.5	6.9

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

1998, the Council recommended that the 1998 TAC for 4VWX silver hake be set at 55,000t. The Council also recommended that the by-catch of groundfish continue to be monitored to ensure that there be no adverse impact on these resources, and the decrease in condition factor be monitored.

For 1999, the Council recommended that the 1999 TAC for 4VWX silver hake be set at 30,000t, and that no more than 15,000t of the 30,000t TAC be taken from the Emerald and LaHave Basins to minimize the catch of juveniles. The Council recommended that as a high priority, DFO/industry conduct a joint workshop to explore methods to spread the catch more evenly across the age groups in this fishery. Also, there were recommendations that the by-catch of other species, as well as the decrease in condition factor be monitored.

For 2000/2001, the Council recommended that the TAC be set at 20,000t and that the 0-group survey be re-instated or that alternative survey methodologies be developed and implemented to increase recruitment information in this stock.

Sources

DFO Science

SSR A3-09(1999) Scotian Shelf Silver Hake

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Inshore Fisheries Ltd. – Claude d'Entremont (2000-010-00479)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

D'Eon Fisheries Ltd. – Robert Sciocchetti (2000-010-00483)

Council's Views on Stock Status

Overall stock Indicator:	low relative to long term mean.
	Compared to average
Spawning biomass:	likely average
Total Biomass:	likely average
Recruitment:	prospects appear good, with two above average year-classes (98' and 99')entering the fishery
Growth and Condition:	long-term declining trends in biological indices with condition, mean length-at-age, and length with 50% maturity all at low levels relative to long-term mean.
Age Structure:	few year classes but typical for this species
Distribution:	resource concentration and distribution exhibit positive trends. Questions on identity of Gulf of Maine portion of stock.
Recent Exploitation:	uncertain

ARGENTINE - 4VWX

low. In November 1993, the Council recommended that, as a precautionary measure, the 1994 TAC for argentine in 4VWX be set at 1,000t. The TAC was set at that level for 1994. In 1994, the Council recommended that the 1995 TAC for 4VWX argentine be set at 1,000t and this recommendation was repeated for 1996, 1997, 1998, 1999 and 2000.

The Council further recommended for 1998, 1999 and again for 2000 that if this fishery is pursued in a commercial fashion, there be a requirement for a scientifically based data collection program to improve knowledge about the resource.

2000 CONSULTATIONS

No comments were received from industry about this stock during the public consultations in Nova Scotia in November 2000.

ANALYSIS & RECOMMENDATIONS

No assessment of this stock was done in 2000 and a new Stock Status Report was not produced. Scientific information available is from very old Stock Status Reports.

DFO Stock Status Reports indicate that there is too little known about this stock to generate sufficient data for analytical purposes. Given the by-catch nature of this fishery and the very low catches in recent years, the Council has no reason to change its outlook on this stock. The recommended 2001/2002 TAC is set at 1,000t, as a precautionary measure.

The FRCC recommends that the TAC for 4VWX argentine be set at 1,000t in 2001/2002.

The FRCC recommends that if this species is pursued in a commercial fashion in the future, there be a requirement for a scientifically based data collection program to improve knowledge about the resource.

HISTORY OF FRCC RECOMMENDATIONS

Catches from this stock, which are taken as by-catch in the silver hake fishery, have not exceeded 360t since 1983. Due to overall reduction in effort and catches in the silver hake fishery catches of argentine remain very

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	10	10	10	10	10	10	10	10	10	1	1	1	1	1	1	1
Catch	0.29	0.2	0.08	0.35	0.11	0.22	0.14	0.03	0.13	0	0.11	0	0	0	0	0

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

No briefs received

SKATES - 4VSW

2000 CONSULTATIONS

The FRCC held public consultations on this stock in Sydney (November 23) and Halifax, Nova Scotia (November 24). A fisherman experienced in the directed skate fishery reported good fishing in the beginning of the experimental fishery with a decline in catch rates in 1997 and a leveling off recently. There are fewer large fish and fish are located in deeper water now, this change in distribution believed to be temperature related. Participants in the directed fishery wish to see a continuation of that fishery. Allocation of skate in the event of recovering groundfish fisheries was identified as an issue to be addressed.

ANALYSIS & RECOMMENDATIONS

The 2000 Stock Status Report indicates that:

- Commercial catch rates have revealed no significant change throughout the duration (1994-2000) of the experimental fishery.
- Size of removals from the fishery peak at 71 cm whereas female winter skate are only 50% mature at 75%.
- Mature fishable biomass has declined progressively from the beginning of the time series, with the 1998 estimate the lowest in the time series
- There has been a progressive reduction in the proportion of larger winter skate in both the fishery and the summer research vessel (RV) survey.
- RV survey biomass shows a redistribution to deeper water in recent years.
- Fishing mortality should not be allowed to increase.

The FRCC believes that, given the decline in the fishable biomass and, in particular, the reduction of the amount of larger winter skate in the population, a reduction in fishing mortality should be implemented. Pursuant to the FRCC's stock rebuilding objective, the following recommendation is made:

The FRCC recommends that total removals for 4VsW skate not exceed 400t in 2001/2002, including by-catches.

It is recognized that more information is required about stock size, stock definition, migration patterns, age and natural and fishing mortality. In an attempt to improve knowledge about the stock,

The FRCC recommends that a tagging program be implemented to track seasonal migrations and determine the extent of movement outside of the 4VsW area; to permit calculation of population size and exploitation rate; and to allow determination of age, growth and longevity, none of which are known with any degree of certainty at this time.

Participants in the traditional groundfish fishery expressed concern over the continuation of a directed skate fishery that has until recently been managed on a by-catch basis. This concern was expressed in the context of the recovery of groundfish resources on the Scotian Shelf. As groundfish recovers, by-catch of skate will cause increased removals of that stock. A continued directed fishery could potentially restrict traditional groundfish fisheries. This issue is flagged for resource managers as an issue to address in anticipation of groundfish recovery. Consultation with those involved in the directed skate fishery and those involved in traditional groundfish fisheries is advised for planned management action.

Given the concern expressed by participants in the traditional groundfish fishery,

The FRCC recommends that fishery managers engage in consultation with industry to develop a plan for implementation that will deal with concerns expressed by those involved in traditional groundfish fisheries about by-catch levels of skate in those fisheries as groundfish stocks recover. Participants from the directed skate fishery should also take part in these discussions so that they may plan in an orderly fashion the future of their own fishery. Special attention should be paid to continuing stock

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC										2	1.6	1.6	1.2	1.2	0.6	0.6
Catch					3.8	5	4.3	2.3	2.1	3.1		1.6	1.04	0.525	0.623	0.764

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

information gathering so that the resource can be managed on a sustainable basis.

History of FRCC Recommendations

In 1994, a combination of closures of traditional groundfish fisheries on the Scotian Shelf and openings in the markets for skate wings resulted in the development of a directed Canadian skate fishery. In 1994, a preliminary TAC of 1,200t was established with an additional 800t allocated to joint industry/science surveys. The 1994 catch accounted for 3,100t, including by-catch in non-directed fisheries. The 1995 directed fishery was regulated by a 1,600t TAC, with an additional 20% by-catch allowed in the directed flatfish fishery. In 1996, the TAC was lowered to 1,200t, with an additional 20% by-catch allowed in the directed flatfish fishery. In October 1996, the FRCC recommended that the 1997 TAC for 4VsW skates be again set at 1,200t, including by-catch, and measures be implemented to diversify size and species of skate in the catch.

For 1998, the FRCC repeated its recommendations that the 1998 TAC for 4VsW skates be set at 1,200t, including by-catch and that measures be implemented to diversify size and species of skate in the catch. The Council also recommended that the experimental fishery continue at a similar level of fishing effort in 1997.

For 1999, the FRCC recommended that the 1999 TAC be reduced by one-half to 600t following the 1998 assessment suggested that the 1,200t was not a sustainable level of catch.

For 2000, the FRCC recommended that the TAC remain at 600t including by-catches, that the experimental fishery continue and that measures be implemented to diversify size and species of skate in the catch.

Sources

DFO Science

SSR A3-29(2000) 4VsW Winter Skate on the Eastern Scotian Shelf (4VsW)

FRCC Consultations

Sydney, NS (November 23)
Halifax, NS (November 24)

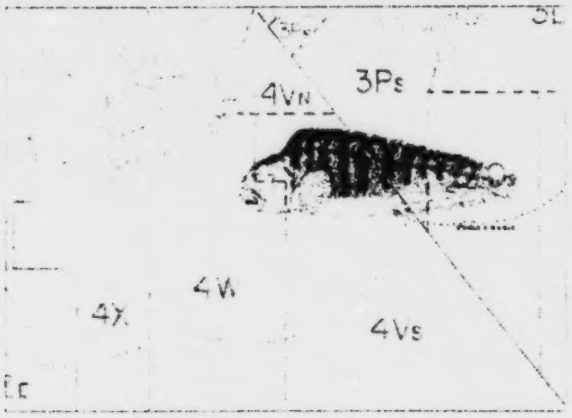
Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status

Overall Stock Indicator:	below average
	Compared to average
Spawning Biomass:	no particular observation
Total Biomass:	below average (thorny skates)
Recruitment:	below average
Growth and Condition:	size declining
Age Structure:	below average
Distribution:	below average
Recent Exploitation:	unsustainable

WOLFFISH - 4VWX+5YZc



2000 CONSULTATIONS

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). There was no discussion on this stock during any of the consultation sessions held in November 2000. Recommendations from industry for this stock advise that status quo (no directed fishery) be continued.

ANALYSIS& RECOMMENDATIONS

This stock was re-assessed in 2000 for the first time since 1996. The 2000 Stock Status Report indicates that:

- Large numbers of immature fish have been caught in research vessel surveys in sub-area 4 through the 1990s.
- Mature biomass is presently low in 4VWX and 4T.
- Fishing mortality has been low since the mid 1990s.
- Until recent recruitment matures, and the mature biomass improves, care must be taken not to increase fishing mortality beyond the status quo.

The FRCC is concerned that developing markets for wolffish will encourage mobile gear to 'top up' on wolffish after targeting another groundfish on a trip. While well within the target fisheries management limit on catches for this stock, the idea that wolffish are subject to mortality in well-known areas means that fishermen are targeting wolffish as a 'directed by-catch'. This activity clearly violates the spirit of the recommendation that there be no directed fishery – by-catch fishery or otherwise on this stock. As long as the concentrated fishing effort – as directed by-catch or otherwise – continues in known fishing areas in 4X where this species is concentrated, it may contribute to overall stock decline.

The FRCC recommends that there be no directed fishery for wolffish in 4VWX in the 2001/2002 fishing year.

The FRCC also recommends that this be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of wolffish in all fisheries directed at other species.

HISTORY OF FRCC RECOMMENDATIONS:

With the limited information available in 1995 on which to base a firm recommendation, the Council recommended a precautionary TAC for 1996 at 600t.

Since 1997, the FRCC has recommended that catches should be limited to the historical levels consistent with the truly by-catch nature of this fishery, with sufficient flexibility to avoid closing traditional directed groundfish fisheries.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000[1]
TAC																
Catch					0.6	0.6	0.5	0.7	0.6	0.4	0.24	0.6	1.03	0.53	0.53	

1. Figures are from the DFO Stock Status Report on Wolffish SSR A3-31(2000)

Sources

DFO Science

SSR A3-31(2000) Wolffish on the Scotian Shelf and Georges Bank and in the Gulf of St. Lawrence (Sub-area 4 and Div. 5YZe)

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status

Overall Stock Indicator:	low
	Compared to average
Spawning Biomass:	low, declining in 4VWX
Total Biomass:	low, declining in 4VWX
Recruitment:	near average, small fish in 4X
Growth and Condition:	below average
Age Structure:	poor
Distribution:	average
Recent Exploitation:	no particular observation

White Hake - 4VW

2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24).

Fishermen noted a significant increase in white hake throughout 4VW over the last two years. The increased incidence of white hake has been linked by some to the shift to warmer temperatures after the cold water Labrador Current event went through the Scotian Shelf in 1998.

Recommendations from industry ranged from status quo (no directed fishery) to a commercial TAC at a moderate level.

Analysis & Recommendations

The most recent assessment for this stock (as 4VWX and 5Zc combined) was in 1998. Since that time, scientific analysis of the white hake stock have been split into two management units: 4VW and 4X5Zc. The 1998 Stock Status Report and Groundfish Update in 2000 indicate that for 4VW white hake:

- Total landings have declined since 1995, and landings in 1998 were the lowest since 1968; landings for 1999 increased slightly.
- Commercial catch rates declined since 1996 for all major fleets (longliners, gillnetters, trawlers), with 1998 demonstrating the lowest catch rates.
- Research vessel survey abundance estimates from Canadian (summer 4VWX, spring 4VsW, spring Georges Bank) and US (spring and fall offshore) sources are all continuing near record lows in 2000 for 4VW.
- The size composition of the summer research vessel survey catches in 4X has been getting smaller since 1995, and mean weights of individual fish in 4VWX surveys have been declining since 1984.
- The stock structure is complex.

The 2000 Groundfish Update states that marginal increases in the RV biomass estimates are not sufficient to alter perceptions of this stock. However, the feedback from fishermen are indications that perhaps this stock is rebounding from a low level. Nevertheless, this feedback has not changed the FRCC's outlook on this stock leading to the following recommendations as in 1999:

The FRCC recommends that there be no directed fishery for white hake in 4VW in 2001/2002.

The FRCC recommends that there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of this stock in all fisheries directed towards other species. In addition, consideration should be given by DFO in consultation with industry, to the establishment of incremental conservation measures.

The FRCC recognizes that the stock structure of white hake in 4VWX+5 may be complex and support the split of the management area into 4VW separate from 4X+5. Fishermen have long argued that stock components are in fact entirely separate stocks.

The FRCC recommends that DFO Science in conjunction with industry undertake a genetics testing program including white hake from 4T to assist in identifying potential stock subcomponents and refined management delineation.

History of FRCC Recommendations

In November 1995, the Council recommended that the 1996 TAC for 4VWX white hake be set at 2,500t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VWX5Zc white hake be increased to 3,500t with flexibility to avoid closing traditional directed groundfish fisheries. The Council added that, for assessment purposes, separation of management units 4VW and 4X5Zc should be implemented and, given the belief that the western stock (4X5Zc) is transboundary, this stock be included in the bilateral

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC												0.5	0.7	0.7	by-catch	
Catch					3.4	3.7	2.9	3.4	3.6	3.1		0.56	0.5	0.4	0.4	0.26

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

consultations on groundfish with the U.S. with the objective of developing a joint management strategy.

For 1998, the FRCC re-iterated its 1997 recommendations and further recommended that as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy). If the result of this review indicates potential adverse affect on local aggregations or spawning components, measures should be put in place to protect this resource.

In 1999, the FRCC repeated its recommendation that there be no directed fishery on this stock.

Sources

DFO Science

SSR A3-10(1998) White hake in 4VWX and 5

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

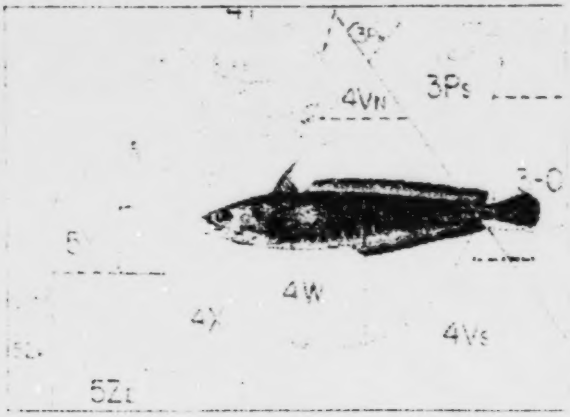
Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Council's Views on Stock Status

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	very low
Total Biomass:	very low
Recruitment:	unknown
Growth and Condition:	declining since 1984
Age Structure:	unknown
Distribution:	stock structure complex, not well understood
Recent Exploitation:	very high in mid-1990's

White Hake - 4X+5Zc



2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24).

Fishermen reported that white hake were plentiful in 4X, in areas where they were never seen before and especially in deep water, and that as a consequence, by-catches were a problem. The increased incidence of white hake has occurred in the last two years and has been linked by some to the shift to warmer temperatures after the cold water Labrador Current event went through the Scotian Shelf in 1998.

Recommendations from industry ranged from status quo (no directed fishery) to asking for a commercial TAC at a moderate level.

Analysis & Recommendations

The most recent assessment for this stock (as 4VWX and subarea 5Zc combined) was in 1998. Since that time, scientific analysis of the white hake stock have been split into two management units: 4VW and 4X+5. The 1998 Stock Status Report and 2000 Groundfish Update indicate that for 4X5Zc:

- Total landings have declined since 1995, and landings in 1998 were the lowest since 1968; landings for 1999 increased slightly.
- Commercial catch rates declined since 1996 for all major fleets (longliners, gillnetters, trawlers), with 1998 demonstrating the lowest catch rates.
- Research vessel survey abundance estimates from Canadian (summer 4VWX, spring 4VsW, spring Georges Bank) and US (spring and fall offshore) sources are all continuing near record lows in 2000 for 4X and 5Zc.
- The size composition of the summer research vessel survey catches in 4X has been getting smaller since 1995, and mean weights of individual fish in 4VWX surveys have been declining since 1984.
- Mortality rates for 4X white hake derived from summer research vessel survey data depict exploitation at or above 50% throughout the 1990's.
- The 4X+5Zc portion of the stock may be at risk of collapse.
- The stock structure is complex.

The 2000 Groundfish Update states that marginal increases in the RV biomass estimates are not sufficient to alter perceptions of this stock. However, the feedback from fishermen are indications that perhaps this stock is rebounding from a low level. Nevertheless, this feedback has not changed the FRCC's outlook on this stock leading to the following recommendations as in 1999:

The FRCC recommends that there be no directed fishery for white hake in 4X+5 in 2001/2002.

The FRCC recommends that there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of this stock in all fisheries directed towards other species. In addition, consideration should be given by DFO in consultation with industry, to the establishment of incremental conservation measures.

History of FRCC Recommendations

In November 1995, the Council recommended that the 1996 TAC for 4VWX white hake be set at 2,500t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VWX5Zc white hake be increased to 3,500t with flexibility to avoid closing traditional directed groundfish fisheries. The Council added that, for assessment purposes, separation of management units 4VW and 4X5Zc should be implemented and, given the belief that the western stock (4X5Zc) is

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC												2.0	2.8	2.8	by-catch	
Catch					3.4	3.7	2.9	3.4	3.6	3.1		2.8	2.6	1.3	1.7	1.83

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

transboundary, this stock be included in the bilateral consultations on groundfish with the U.S. with the objective of developing a joint management strategy.

For 1998, the FRCC re-iterated its 1997 recommendations and further recommended that as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy). If the result of this review indicates potential adverse affect on local aggregations or spawning components, measures should be put in place to protect this resource.

In 1999, the FRCC repeated its recommendation that there be no directed fishery on this stock.

Sources

DFO Science

SSR A3-10(1998) White hake in 4VWX and 5

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

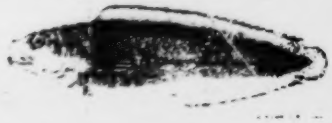
<45' Shelburne County Fixed Gear Quota Group – Weldon Smith (2000-010-00481)

Shelburne Co. Competitive Fishermen's Assoc. – Pam Decker (2000-010-00482)

Council's Views on Stock Status

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	very low
Total Biomass:	very low
Recruitment:	unknown
Growth and Condition:	declining since 1984
Age Structure:	unknown
Distribution:	stock structure complex, not well understood
Recent Exploitation:	very high in mid-1990's

Cusk - 4VWX



2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). Limited input indicated and agreed with science information that the stock is very low. Rebuilding or status quo was suggested. There was indication that fishable concentrations do exist in selected areas. There were also suggestions that when subject to significant fishing pressure, recovery of cusk is very slow or even impossible in areas where cusk inhabit.

Analysis & Recommendations

The 1998 Stock Status Report and the Groundfish Updates in 1999 and 2000 indicate that:

- Landings in 1998 were 1490t, landings have remained below the long-term mean of 3469t since 1993. Landings in 1999 were 1028 t (15 months).
- Research vessel survey mean weight per tow declined abruptly in 1992 and has remained below the long-term mean of 1.29 kg since that time. The 1998 value is the lowest in the survey history.
- The cusk stock collapsed abruptly in 1992 and has remained very low.
- Research vessel survey catches have shown a restriction of distribution to the western portion of 4X.
- Future catches should be substantially reduced and measures should be undertaken to conserve and rebuild the cusk stock.
- An essential requirement of rebuilding the cusk stock is the accurate recording of the location of all catches.
- This stock shows no sign of improvement in 2000. It is likely that the 1,000t cap placed on this stock is not providing adequate restrictions on catches to allow for the stock to rebuild and more restrictive measures may be required.

The FRCC has not changed its outlook on this stock. A more comprehensive review in 2001 could provide additional information on stock status and appropriate conservation measures for this stock.

The FRCC recommends that there be no directed fishery for cusk in 4VWX in 2001/2002.

A restricted by-catch will aid in rebuilding efforts and should be continued.

The FRCC recommends that there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of cusk in all fisheries directed at other species.

History of FRCC Recommendations

In November 1995, the Council recommended that the 1996 TAC for 4VWX cusk be set at 1500t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VWX cusk should not exceed historical catch levels, with sufficient flexibility to avoid closing traditional directed groundfish fisheries. This recommendation was repeated for 1998, 1999 and 2000.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC												1.5	0	0	0	0
Catch					2.7	3.1	3.8	4.2	2.4	1.9		1.91		1.46	1.02	0.746

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Sources

DFO Science

SSR A3-14(1998) Cusk on the Scotian Shelf

SSR A3-35(1999) Updates on selected Scotian Shelf groundfish stocks in 1999

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status

Overall Stock Indicator:	low
	Compared to average
Spawning Biomass:	low
Total Biomass:	historical low
Recruitment:	no sign
Growth and Condition:	poor
Age Structure:	below average
Distribution:	no significant change
Recent Exploitation:	no particular observation

MONKFISH - 4VWX

2000 CONSULTATIONS

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). Comments were restricted to industry located in management area 4X. Industry observations indicated that monkfish is generally abundant although localized, and current by-catch measures and fishing levels should be continued.

ANALYSIS & RECOMMENDATIONS

The previous full assessment of this stock was completed in 1996 and the most recent scientific information here is from the latest full assessment in 2000. The 2000 Stock Status Report and the 1999 Groundfish Update and indicate that:

- Overall abundance and distribution has improved to near the long term average.
- Recruitment is improved and currently high.
- Large fish over 60 centimeters have declined significantly and biomass remains low.
- Mortality appears to be increasing.
- Condition factor is currently low.

Historically, monkfish have been almost exclusively a by-catch of groundfish and scallop fishing. Between 1992 and 1994, the less than 65 ft. mobile fleet directed for monkfish in 4X. Consequently landings in this area increased from just over 300t in 1991 to 1,100t in 1994. Landings have averaged approximately 1000t since then in response to market conditions. Abundance is highest in central Scotian Shelf and on the edges of the banks. There are concentrations of smaller monkfish in the basins.

A joint industry/science five year program to improve knowledge of the resource has been conducted by five mobile gear vessels less than 65 feet in 4X and 5Zc from 1995-1999 in which a directed fishery for 300t was carried out in cooperation with DFO. Most of the fishing was conducted in localized areas or so-called monkfish holes located in Crowell Basin. DFO Science recommends that catches be maintained at a low level and a continuation of a cautious approach is warranted until productivity and harvesting effects are more accurately defined.

The FRCC has not significantly changed its outlook on this stock.

The FRCC recommends that there be no directed fishery for monkfish in 4VWX in 2001/2002.

Assessment information and consultations indicate that although this stock is managed as a by-catch, there is significant directed effort on natural concentrations of the species in restricted basin areas in order to maximize by-catch allowances based on existing directed fisheries. This could result in over exploitation under certain circumstances such as strong market conditions.

The FRCC recommends that there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of monkfish in all fisheries directed at other species.

The FRCC recommends that total removals from all sources be reduced to levels below the lowest annual removals in the last five years.

The FRCC also recommends that measures be undertaken by DFO Science to evaluate known geographic concentrations to determine localized biomass levels and assess sustainability of directed fishing efforts in areas of monkfish concentrations.

Concerns were expressed by DFO Science related to the actual size composition and total removals of monkfish as by-catch in the scallop fisheries, particularly in the Bay of Fundy inshore scallop fleet and the potential negative impacts this may have on the stock. There are indications that incoming scallop recruitment in the Bay of Fundy may be very strong which will support increased fishing effort by the inshore scallop fleet and possible increased by-catch of monkfish.

The FRCC recommends that efforts be expanded to determine the levels of monkfish by-catch and removals of monkfish by the scallop fleets.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC												0.7	0.2	0	0	0
Catch					0.6	0.8	0.8	0.8	0.6	1.2		0.71	1.2	0.82	1.17	0.41

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

History of FRCC Recommendations

In November 1995, the Council recommended that the 1996 TAC for 4VWX monkfish be set at 700t. For both 1997 and 1998, the FRCC recommended that the TAC for 4VWX monkfish should not exceed historical levels, with sufficient flexibility to avoid closing traditional direct groundfish fisheries. The Council also recommended that monkfish be treated as a by-catch in all other fisheries and the joint industry/DFO science five year program should be continued. In 1999 the Council recommended no directed fishery, that restrictive by-catch measures be implemented and that the joint industry / DFO science 5 year program be continued.

Sources

DFO Science

SSR A3-35(1999) Updates on selected Scotian Shelf groundfish stocks in 1999

SSR A3-30(2000) Monkfish on the Scotian Shelf and Northeast Georges Bank (4VWX and 5Zc)

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status

Overall Stock Indicator:	average
	Compared to average
Spawning Biomass:	below average, large fish declining
Total Biomass:	near average
Recruitment:	strong / Increasing
Growth and Condition:	stable
Age Structure:	no particular observation
Distribution:	average
Recent Exploitation:	above average

Atlantic Halibut - 3NOPs4VWX5Zc

2000 Consultations

The FRCC held public consultations on this stock in Shelburne (November 22), Sydney (November 23) and Halifax, Nova Scotia (November 24). Industry commonly observes widespread abundance with a mixture of sizes of Atlantic halibut throughout its range. It was stated in Shelburne that the reduction in catches in the late 1980's was due in part to a redirection of effort away from Atlantic halibut towards swordfish. Most comments pointed out that the 1995 TAC reduction from 1500t to 850t arbitrarily followed the reduction in the catch. While the small directional increase to 1000t in 2000 was expressed to be a step in the right direction, a recurring view is that the TAC could easily be returned to 1500t without placing the stock in any danger.

Analysis & Recommendations

The most recent full assessment was conducted in 1997. The 2000 Update provided by Science Branch indicates:

- Both weight and numbers per tow remain below the long term average for the research vessel survey series.
- The new information presented does not suggest that the previous outlook needs to be revised.

In light of the Update received from Science Branch, it seems appropriate to repeat some of the Council's February 2000 comments on DFO's assessment:

"The FRCC continues to note that the Stock Status Report and the information from fishermen are not compatible for this stock. The last assessment for this stock was done in 1997. This assessment, based on the DFO research vessel (RV) survey, indicates that abundance estimates are low and that halibut catches show reduced size ranges. It was noted that restrictive management regulations do not allow one to judge the status of the stock based on commercial catch rates.

Industry participants confirm DFO's view that the resource status is not accurately reflected by the current RV survey. They report increased abundance in both the commercial portion of the industry/DFO longline survey and in the limited commercial fishery that they are able to prosecute with the available quota. The DFO RV survey does not cover depths beyond 200 fathoms. Industry fishing experience has demonstrated that good catches of large halibut occur in depths from 200-400 fathoms.

In addition, the RV survey does not cover the entire geographic range of this stock, in particular the Bay of Fundy area, and the Grand Banks. Exclusion of the Grand Banks is a key deficiency because it is believed that the larger fish are resident there and their exclusion may overstate the mortality calculation for the resource. Catchability of halibut in the DFO RV survey is also an issue with fishermen since the gear is not well suited to catch halibut."

The Council commends the cooperative efforts of the industry and Science Branch in the continuation of the halibut longline survey that commenced in 1998. This survey, for which 1999 was the first year of full coverage, provides the best opportunity to measure the condition of this resource.

The FRCC recommends that the industry/DFO halibut longline survey be continued with sufficient observer coverage to ensure its integrity.

The FRCC recommends that DFO incorporate into the industry/DFO longline survey:

a. initiatives to evaluate mortality/survival rates of halibut caught and released in this fishery;

b. initiatives to determine the appropriate size of larger female halibut that might be caught and released as part of a future management plan; and

c. evaluation of tag mark recapture information to generate mortality and biomass estimates.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC				3.2	3.2	3.2	3.2	3.2	3.2	1.5	0.85	0.85	0.85	0.85	0.85	1.0
Catch	4	3.3	2.6	2.3	1.9	2.1	2.2	1.30	1.2	1.04	0.72	0.79	1.16	0.96	1.29	0.13

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

The Council notes with dissatisfaction that the proposed age validation study from which population age structure and mortality estimates would be generated, was not funded in 2000. By not funding this study, Science Branch effectively removes the possibility of establishing a firm foundation of information that is required in order to properly manage this stock complex.

The FRCC reiterates and emphasizes its previous recommendation that age determination of the Atlantic halibut population be given high priority.

Last year, as part of its review and recommendation process, the Council requested additional data from Science Branch based primarily on the results of the longline survey. DFO's response stated the additional data would require substantial work that would normally be investigated during a full assessment. At that time, the Deputy Minister confirmed that the next full assessment of this stock was planned for 2001. The FRCC supports DFO's undertaking to conduct a full assessment of Atlantic halibut in 2001.

The FRCC recommends that sufficient resources be brought to bear to ensure that the longline survey results and proper age and mortality information are integrated into this full assessment to generate an age structure, absolute biomass estimate and exploitation/harvest rates.

Last year the Council recommended that DFO, in consultation with industry, develop an Atlantic-wide protocol to address TAC and commercial quota issues related to removals of targeted species and by-catch species arising from all industry/DFO surveys. Until such a protocol is developed, removals of halibut and by-catch species should continue to be addressed as in the past, i.e. the catches of Atlantic halibut from the industry/DFO longline survey are to be in addition to the TAC.

In light of the aforementioned problems related to the DFO RV survey, and considering the observations of industry based on their experience in the commercial

Sources

DFO Science

SSR A3-23(1997) Scotian Shelf and southern Grand Bank halibut

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Eastern Nova Scotia 4VsW Management Board – Nellie Baker (2000-010-00472)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

<45' Shelburne County Fixed Gear Quota Group – Weldon Smith (2000-010-00481)

Council's Views on Stock Status

Overall Stock Indicator:	probably in moderate condition
Spawning biomass:	unknown
Total biomass:	unknown
Recruitment:	indications of incoming recruitment
Growth/Condition:	no reliable information
Age structure:	unknown
Distribution:	appears to be widely distributed
Recent exploitation:	unknown

fishery, the Council decided to recommend a directional increase in the TAC from 850t to 1,000t for 2000/2001. The Council recognizes and shares the frustration of fishermen in wanting TAC decisions to be based on the real status of this resource. The Council supports DFO's intention to conduct a full assessment in 2001 which should for the first time use the longline survey results along with proper age and mortality information to generate an age structure, biomass estimate, and harvest rates associated with the fishery. While waiting for the full assessment to be conducted in 2001, the Council is prepared to further recognize harvesters' views that the stock condition continues to improve.

The FRCC recommends that the TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 1,150t for 2001/2002.

History of FRCC Recommendations

In November 1993, the Council recommended that the 1994 TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 1,500t as a precautionary measure. The Council also recommended that the mandatory landing provisions be reviewed with the aim of allowing halibut smaller than 81 cm (32 inches) to be released. This was implemented in 1994 and remains a critical component of the FRCC recommendation for this stock. In 1994, the Council recommended that the 1995 TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 850t as a precautionary measure. The Council recommended also that mandatory landing provisions be reviewed regarding the discarding of incidental catches of halibut smaller than 32 inches. In November 1995, the Council recommended that the 1996 TAC for Atlantic halibut remain at 850t with the same small halibut release provision.

In October 1996, the FRCC recommended that the 1997 TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 850t, and that the provision for the release of halibut smaller than 81cm be maintained. In addition to this recommendation the Council asked that a joint DFO/industry study be conducted to assist in the overall assessment process, such as appropriate biological sampling, a tagging/movement component, identification of stock sub-components and identification of alternative survey indices. The Council reiterated these recommendations for 1998 and for 1999.

For 1999 the Council also recommended that DFO Science investigate the biological link of Atlantic halibut in 3Pn (not currently included as part of existing management units) to adjacent stocks in management units 4RST and 3NOPs4VWX5Zc.

For 2000 the Council recommended a directional increase in the TAC from 850t to 1000t, as well as initiatives to evaluate mortality/survival and the appropriate size for females associated with catch and release requirements, and to age the population.

Chapter 3: Redfish Stocks
Stock-by-Stock Recommendations

REDFISH UNIT 1 - 4RST+3PN (JAN-MAY)+4VN (JAN-MAY)

2000 CONSULTATIONS

An Atlantic-wide consultation was held in Halifax (November 24) and verbal and written comments were collected from industry representatives in late November and early December, 2000. Industry generally holds the view that the stock remains in a relatively poor condition; with lower abundance than levels of the early 1990's despite the closure that has been in effect. A Gulf of St. Lawrence-based group expressed considerable concern regarding the questions about stock affinities between Units 1 and 2, and recommended that a precautionary approach be followed while and until further information was collected. There was support for the continuance of the index and sentinel fisheries, as the information obtained increased resolution of the stock's status. Several industry representatives considered that 1,500t was sufficient for these elements.

ANALYSIS & RECOMMENDATIONS

The preliminary results of a multidisciplinary redfish research program initiated in 1996 to examine stock affiliations between and within current redfish management units has raised uncertainties regarding the discreteness of redfish in Units 1 and 2. The final results of this program are now expected in the coming year but it is likely that further investigations may be required before management unit changes can be fully evaluated. The Stock Status Report for 2000 was developed on the basis of existing stock unit definition for Unit 1.

The 2000 DFO Stock Status Report indicates:

- The biomass is stable at low levels since 1995.
- There is no sign of strong incoming year classes. Although two year classes (1996 & 1998) are somewhat larger in the survey than any since 1988, they are substantially less abundant than the 1988 year class. Like the 1988 year class, which subsequently disappeared from Unit 1, the 1996 and 1998 year classes are felt to be mostly *S. faciatius*, and thus cannot yet be counted upon to contribute to future fisheries.
- Compared to traditional patterns, distribution remains restricted, with concentrations being found mainly in the Cabot Strait area in Division 4R and sub-division 3Pn. There are continuing indications that the outward autumn migration of redfish from the Gulf may be occurring earlier than was traditionally observed.
- Analysis of the location and timing of Unit 2 catches indicates that 1) no further closures were required in 3Pn in the fall period, and 2) no restrictions were required in the winter fishery in 3Ps, in order to protect against incidental catches of Unit 1 resource.
- The recent multi-disciplinary study indicates no genetic differences in redfish populations in Units 1 and 2 for both redfish species (*S. fasciatus* and *S. mentella*), as well as with the hybrid that is found only in these areas. Further studies will be required before the management implications of this mixing can be assessed.

The Council remains concerned about the status of this stock, for which any substantial recovery has yet to occur. While both the 1996 and 1998 year classes of *S. fasciatus* may be stronger than other recent year classes, neither appears to be strong enough to contribute significantly to the fishery. Furthermore, it is not known whether this year class of *S. fasciatus* will disappear prior to recruiting to the fishery, as occurred with the 1988 year class. Regardless, whenever a significant year class is produced, it will take 10 years before these fish will be available to the commercial fishery. Indications that predation by seals may have tripled since the 1970s remain a significant concern for the future of this stock.

The FRCC recommends that there be no directed commercial fishery for Unit 1 Redfish in 2001/2002.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	50.6	55.6	55.6	55.6	57	57	57	67	60	30			Moratorium			
Catch	35.1	36.4	43.4	51.9	55.2	63.8	68	77.4	51.8	19.8	0.02	0.02	0.02	0.30	1.05	1.03

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

Since 1998, the re-establishment of the commercial fishery index and the industry/science survey have helped to put redfish fishers in direct contact with the resource and has generated important information about the stock. The Council believes that these activities should continue in order to generate information that may be used to supplement that which is obtained through DFO's annual research survey. While the FRCC supports an on-going index fishery in Unit 1, the Council remains sensitive that an annual harvest of 2,000t may not be appropriate for the long term, given the continuing low levels of recruitment and spawning biomass. However, the Council notes that these efforts have provided interesting results in 1999 and 2000, and is especially interested in reported good catches in Unit 1 in early December, 2000. The Council therefore feels that the current level of index efforts should continue for at least the 2001/2002 season.

The FRCC recommends the established joint industry/science survey and the index fishing program continue in the 2001/2002 season. The level of harvest allowed for these efforts in 2001/2002 should not be allowed to exceed 2,000t.

The Council considers that the Redfish Multidisciplinary Research Program has posed significant and important questions regarding affinities among the various redfish stocks in Atlantic Canada, and notes with dissatisfaction that the final report on these key studies is not yet available. The 2000 Stock Status Report articulates a number of the important issues that arise from this Program which the Council believes must be followed up in the coming year, including clarification on the implications associated with apparent stock mixing between Units 1 and 2, and the need to confirm the impact of seal predation.

The FRCC reiterates its previous recommendation that DFO bring together scientists, industry and managers to identify and prioritize work that needs to be undertaken as follow-up to the results of the Redfish Multidisciplinary Research Program. This initiative should be undertaken, and sufficient human and financial resources should be brought to

Sources

DFO Science

SSR 01-A1(2000) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

FRCC Consultations

Halifax, NS (November 24)

Written Briefs

Fédération des pêcheurs semi-hauturiers du Québec – Gabrielle Landry (2000-010-00492)

Association des pêcheurs de poisson de fond Acadiens – Alyre Gauvin (2000-001-09338)

Council's Views on Stock Status

Overall Stock Condition:	stable at a low level
	Compared to average
Spawning Biomass:	stable at a low level
Total Biomass:	stable at a low level
Recruitment:	no significant recruitment since 1980 yearclass
Growth and Condition:	average, similar to other redfish stocks
Age Structure:	poor
Distribution:	relatively restricted
Recent Exploitation:	low, approximately 2% of survey biomass
Natural Mortality:	may be higher than previously accounted for.

bear, with the objective of incorporating results into the future management of the various stocks as soon as possible.

It is clear that no recovery will occur in this stock unless and until substantial juvenile production resumes and these fish survive to contribute to the spawning stock biomass and the fishery. Monitoring and protection of juvenile redfish must remain a high priority, in particular if and when a large year class of the type which has supported the fishery in the past is produced. The FRCC notes that the Gulf shrimp fishery, which fishes with small mesh trawls over a significant portion of the summer stock area for Unit 1 redfish, has likely reduced its effect on the redfish resource through the introduction of grate technology into the fishery. These improvements notwithstanding, the Council feels it is important to monitor and document juvenile redfish by-catches closely and thereby be in a position to consider appropriate additional measures to protect those significant future year classes essential to rebuilding this stock.

The FRCC recommends that juvenile redfish by-catches in the small mesh shrimp fishery in the Gulf be closely monitored; and that such information available now and in the future be analysed and made available for management and conservation discussions.

History of FRCC Recommendations

In November 1993, the Council expressed its concern about this stock and recommended that the **1994** TAC be set at 30,000t (a 50% reduction) with the view to keeping it at this level for the following two years, if at all possible, to achieve stability.

In its 1994 report, the Council recommended, for Unit 1 redfish, that current scientific work be strengthened and elaborated in co-operation with the industry so as to clarify redfish management units, as well as to better understand migration patterns and stock status and that the **1995** TAC be set at 7,500t. As well, the Council recommended that a small fish protocol be established to protect juvenile redfish; and that Fisheries and Oceans, in consultation with industry stakeholders, limit the fishery as much as practical during the January to June period. The Minister considered the FRCC TAC recommendation but concluded that no fishery for Unit 1 redfish should occur in 1995. Further to the Council's recommendation for a joint industry/science initiative for redfish, a multi-disciplinary research program was developed jointly with industry stakeholders and DFO in an attempt to address key questions related to redfish biology, stock definition and migrations, and stock status. **Since 1996**, the FRCC annually recommended continuing the moratorium and minimizing the by-catch of redfish in other fisheries.

For 1997, the FRCC recommended that cooperative industry science surveys take place. **For 1998**, the FRCC further recommended that a joint industry science sentinel survey be established, on an ongoing basis, to include both a fully scientific component and a component to re-establish the commercial catch rate index. It was recommended that catches for this program not exceed 1,000t. Continuation of this Program was recommended **for 1999 and 2000**, with the level of available quota being increased to 2,000t in order to improve the validity of the CPUE index. **For 2000**, the Council requested that DFO Science Branch identify what changes might be needed with respect to boundaries of the Units 1 and 2 stock management areas.

Redfish Unit 2 - 3Ps4Vs4Wfg+3Pn4Vn (Jun-Dec)

2000 Consultations

The FRCC's Atlantic-wide public consultation on redfish stocks was held at Halifax, Nova Scotia on November 24, 2000. Written comments were also received.

Industry representatives observed that the size of redfish in the catch was not as uniform as was being implied in the SSR, noting the size in the commercial catch ranged from 28-38 cm. Skepticism was also expressed that there was such a clear demarcation between 1980 and 1988 year classes being exclusively *S. mentella* and *S. fasciatus* respectively. It was stated there had been some decline in catch rates in 2000 over the 1998-99 period (higher than in 1997) but this was due in part to unusually rough weather conditions experienced during the bulk of the fishery which occurred in the November through March period. While stressing there was too little information to reach firm conclusions, industry stated it would be prudent to adopt a more cautious approach to the TAC level over the next two years. Noting that the next DFO survey was to occur in 2002, industry representatives proposed a two-year approach to setting the TAC, i.e. reducing the TAC in 2001 to 9,000t and in 2002 to 8,000t. This proposal was in part to enable industry to begin to make operational and other adjustments that might be necessary should the next series of research surveys confirm that deeper quota cuts were necessary in the future. A Gulf-based group expressed considerable concern regarding the questions about stock affinities between Units 1 and 2 and recommended that a precautionary approach be followed while and until further information was collected.

All present welcomed the reinstatement of the dedicated DFO research vessel survey in Unit 2, with DFO's redfish biologist confirming that it is planned for this survey to be conducted every second year.

Analysis & Recommendations

The FRCC notes with dissatisfaction that the follow-up investigations to the Redfish Multidisciplinary Research Program did not proceed in 2000 as was recommended in our previous report. These further investigations are necessary in order to have a firm foundation of information by which the redfish stocks, particularly in Units 1 and 2, may be managed.

The FRCC reiterates its previous recommendation that DFO bring together scientists, industry, and managers to identify and priorize work that needs to be undertaken as follow-up to the results of the Redfish Multidisciplinary Research Program. This initiative should be undertaken, and sufficient human and financial resources should be brought to bear, with the objective of incorporating results into future management of the various stocks as soon as possible.

The DFO Stock Status Report for 2000 was developed on the basis of stock unit boundaries as they currently exist; it indicates that:

- DFO surveys of 1994-1997 and 2000 suggest stability. GEAC surveys indicate some decline in the biomass since 1998.
- The 1980 year class accounted for 30% of the DFO survey abundance and 60% of the biomass. The 1988 year class accounted for 22% of the DFO survey abundance and 19% of the biomass. The 1994 and 1998 year classes (<22 cm) together represented about 35% of the DFO survey abundance and 5% of the biomass.
- The 1988 year class is increasing its contribution to the adult population but is less abundant than the 1980 year class that has been sustaining the fishery for the past ten years.
- The total available adult population is expected to decline in the next 1 to 2 years as a result of the 1980 year class being harvested. Thereafter, prospects for both the stock and the fishery

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
TAC	18	18	18	15	15	10	15	25	28	25	14	10	10	11	12	10
Catch	11.5	9.7	14	10.7	15.3	15.8	23.8	24.6	27	24.1	12.4	9.3	9.6	10.9	17.2	4.37

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

will depend heavily on the degree to which the 1988 and 1994 year classes contribute to reproductive potential and yield.

With a history of intermittent recruitment pulses in this slow growing species, it is to be expected that the adult biomass will fluctuate up and down in periodic cycles. The primary conservation question in relation to this stock at this time is how fast the available yield of the 1980 year class should be drawn upon in the short term, i.e. over the next two years, pending confirmation of the strength of more recent year classes recruiting to the fishery. A two year planning horizon appears to be appropriate at this stage, in that the next comprehensive view of this stock will not be available until after the results of the 2002 DFO research survey are available. At that time, the relative strength of both the 1988 and 1994 year classes will be better known. At that time, there should also be an early indication of whether a significant year class of *S. mentella* will have resulted from the warm temperature spike experienced in 2000.

The RV survey in 2000 indicates a stable survey biomass of approximately 250,000t. Acoustic data indicates the mean availability to the research trawl was about 80%. At this level, the 2000/2001 TAC of 10,000t represents a fairly conservative harvest rate of less than 4 % ($F_{0.1}$ approximates an exploitation rate of 12%). However, there is concern that year classes since 1980 have consisted primarily of *S.fasciatus*, which appear to have experienced some decline in strength despite very low exploitation. For greater clarification on this point, the abundance of the 1988 year class declined by about 20% between 1994-95 and 1996-97, though the 2000 abundance appears to be similar to that of 1996-97. This observation raises some uncertainty in relation to the ability of these 'post-1980' year classes to contribute to future fisheries. It may therefore be appropriate to discount some of the future contribution associated with the 40% of

Sources

DFO Science

SSR 01-A1(2000) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

FRCC Consultations

Halifax, NS (November 24)

Written Briefs

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Fédération des pêcheurs semi-hauturiers du Québec – Gabrielle Landry (2000-010-00492)

Association des pêcheurs de poisson de fond Acadiens – Alyre Gauvin (2000-001-09338)

Council's Views on Stock Status

Overall Stock Condition:	stable
Spawning Biomass:	stable
Total Biomass:	stable
Recruitment:	increasingly uncertain over actual strength of 1988 and 1994 year classes
Growth and Condition:	average; similar to other redfish stocks
Age Structure:	moderate with respect to the total biomass; concern about the confirmed presence of only one significant year class of *S. mentella*
Distribution:	good; similar to previous years
Recent Exploitation:	low

the biomass that relates to the post 1980 year classes. However, even by discounting the entire biomass associated with fish younger than the 1980 year class, the corresponding harvest rate associated with harvesting only the 1980 year class at the level of about 10,000t would be less than 6%. In considering these factors, the Council is also concerned that the stock has only one significant year class of *S.mentella* (i.e. the 1980 year class) that has supported this fishery for the past 12 years. In light of the fact that the fishery continues to focus primarily on this 1980 year class, and that it will take at least 8-10 years before any new year class of *S. mentella* can enter the fishery, the Council believes additional caution should be exercised.

The selection of a specific redfish TAC in a given year is somewhat arbitrary. In the absence of a longer-term strategy, the selection of a specific TAC can only be reasonably justified as a 'directional' signal. A key aspect of a longer-term strategy is the extent to which industry and resource managers might agree to 'draw down' from the fishable biomass that would be projected to be available over the years between recruitment pulses. Pursuant to the need to develop a longer-term conservation strategy for this stock, the FRCC plans to initiate discussions with industry and DFO in 2001.

Acknowledging that the next comprehensive scientific review of this stock will not be available until 2002, the Council concludes there is a need for caution as well a need for reasonable stability in harvest levels in this interim period. Being cognizant of the conservative harvest rate, and in the context of using the time to develop a longer-term strategy for this stock, the FRCC proposes an interim 2-year planning framework.

The FRCC recommends that the 2001/2002 TAC be set at 8,000t. If the January through September 2001 commercial catch includes the 1988 year class at levels reasonably approximating its contribution to the estimated fishable biomass (i.e. 20%), it is recommended that the TAC for 2002/2003 also be set at 8,000t. If the 2001 catch continues to reflect a disproportionately high presence of the 1980 year class, the Council intends to recommend that the TAC for 2002/2003 should be further reduced.

The Council observes that future conservation measures for this stock are likely to include additional area closures or CHP requirements of the respective fleets.

The FRCC recommends that DFO Science Branch initiate effective size frequency monitoring regarding the redfish catch of each fleet sector, through the at-sea observer, port sampling and dockside monitoring programs, and incorporate these results into a report to be tabled at the 2001 redfish RAP. The report should also incorporate both catch and research vessel information (both DFO and GEAC) on size frequencies and species identification by water depth within each statistical subarea. The report should consolidate the aforementioned information and identify specific fishing areas that are associated with the respective year classes and species.

Ensuring the future viability of the *S.mentella* biomass is an important objective of the Council. While future recruitment cannot be managed, it is believed that all reasonable efforts should be made to facilitate the opportunity for recruitment to occur. Available information suggests that *S. mentella* extrudes its young over the April through June period. The Council's preference is to implement the April closure effective immediately. However, it is acknowledged that late notice of such a requirement may cause severe operational difficulties.

The FRCC recommends that the May/June 'spawning closure' be extended to include the month of April effective in 2002. Fishing enterprises are requested to make every effort to minimize their harvest of *S.mentella* during April of 2001.

Last year, the FRCC requested that DFO Science Branch conduct a targeted investigation of redfish migration between Units 1 and 2, with the objective of concluding what additional management measures (if any) should be made to minimize fishing on concentrations that may contain redfish from both Units 1 and 2. As an interim precautionary measure reflecting indications that there may be an earlier migration of Unit 1 redfish outside the Gulf, the FRCC recommended that the closure of directed redfish fishing in 3Pn and 4Vn be extended to include the month of October 2000.

The FRCC observes that DFO did not implement the October closure as was recommended last year. The 2000 RAP addressed the migration issue with the conclusion there seems to be little justification to extend the winter 3Pn closure farther eastward, but it seems to be prudent to continue the recommended 3Pn closure from October through June.

The FRCC recommends that 3PN and 4Vn be closed to directed redfish fishing during the months of October through June until further review.

History of FRCC Recommendations

In November 1993, the Council recommended that the TAC for Unit 2 redfish be reduced from 28,000t to 25,000t in **1994**. In November 1994, the Council recommended that the TAC be set at 20,000t for **1995** and that a small fish protocol be established to protect juvenile redfish. The Council also recommended that no fishing be permitted in 3Pn and 4Vn during November and December and that scientific work clarify redfish management units and develop a better understanding of migration patterns and stock status. The Council recommended that the fishery be limited as much as practical during the January through June period to avoid taking fish that may, in fact, be fish from Unit 1. The Minister reduced the TAC to 14,000t for 1995 and implemented measures to avoid catching Unit 1 redfish when they could be mixed with redfish from Unit 2.

The Council recommended a TAC reduction to 10,000t for **1996** with: rigid small fish protocols, no fishing in 3Pn and 4Vn during November and December, and limiting, as much as possible, fishing from January to June. In **1997**, the FRCC recommended that the TAC remain at 10,000t, small fish protocols be continued and, DFO and Industry discuss the merits of protecting the 1988 year-class.

For **1998** the Council recommended that the TAC be set at 11,000t, seasonal and area closures be continued, and the small fish protocol be continued and rigorously enforced and DFO and industry discuss the merits of continuing to protect the 1988 year-class. The FRCC also recommended that DFO Science seek to determine a) the long term potential for this stock, and b) the historical profile of exploitation rates. The Council recommended that the **1999** TAC be set at 12,000t, that seasonal area closures be continued, that the DFO redfish survey in the area be re-instituted as part of an overall plan for redfish research surveys in all management areas, and requested Science Branch to identify what changes might be needed with respect to boundaries of the Units 1 and 2 management areas. A TAC of 10,000t was recommended for 2000, as was an October closure of 3Pn and 4Vn to directed redfish fishing. The Council also recommended that Science Branch initiate activities as follow-up to the Redfish Multidisciplinary Research Program, develop a multi-year plan for redfish research activities, and investigate migration and mixing between Unit 1 and 2.

Redfish Unit 3 - 4WdehklX

2000 Consultations

The consultation meeting for Unit 3 redfish took place in Halifax, Nova Scotia, on November 24, 2000. The FRCC also asked stakeholders their views on this stock in Shelburne (November 22) and in Sydney, NS (November 23). Also the Council received briefs from various industry participants as well as fishermen's groups. Stakeholders were of the view that Unit 3 redfish appears to be stable, recruitment is apparent, and the TAC should remain at 9000t for 2001/2002. Stakeholders and DFO agree that the "Bowtie" year round closed area for juvenile redfish is working well and that the small redfish landings are well within the small fish protocol. There were mentions of the latest genetic studies that indicate that there are two separate *S. fasciatus* populations, one on the Scotian Shelf proper (4Xo) and the other in the Crowell and Jordan basins. It was felt that the genetic tests performed were inconclusive due to low sampling intensity. A problem encountered by industry participants was that they had trouble staying within the DFO set 10% by-catch of other species while directing for redfish. The principal by-catch consists of pollock, with smaller amounts of cod, haddock, white hake, and these fish have been of larger marketable size. All this by-catch is being deducted from their respective quotas so it is a management problem which impacts on the landings. Redfish market prices were noted to be depressed in 2000.

Analysis & Recommendations

A Redfish Multidisciplinary Research Program has been conducted over recent years. This program has included a study of stock affiliations between and within current redfish management units. Unfortunately, follow up investigations which were to proceed in 2000 did not materialize. The Stock Status Report for 1999 was developed on the basis of stock unit boundaries as they currently exist. There was no formal assessment conducted on Unit 3 redfish this year. The 1999 DFO Stock Status Report and the 2000 DFO Groundfish Update indicate that:

- Research vessel surveys indicate stability in the population biomass.
- Decreasing commercial catches reflect reduced demand for smaller size redfish, and are not a reflection of reduced abundance of the resource.
- There is no biological basis to suggest a need for change in the management of the resource at this time.

The Council recognizes and commends industry and DFO for establishing the closed area to protect juvenile redfish (the 'Bowtie'), and acknowledges prevailing market conditions that reinforced efforts made to avoid small fish. However, this stock (*S. fasciatus*) consists of fish that are generally smaller than that found in Units 1 and 2, and a change towards more positive market conditions could reintroduce the potential for small fish to be exposed to the fishery.

The FRCC recommends that at-sea observer coverage for the involved fleets be set at an appropriate level that enables managers to properly evaluate by-catches for observed versus unobserved vessels, and to take effective measures to address apparent discarding situations.

The SSR concludes that the total population biomass is stable, with some indications of improved recruitment in some areas. DFO appears to concur with the majority of views expressed by industry in discounting the significance of reduced commercial catches. As was noted last year, the Council observes that not all the grounds available to the resource, and in particular those grounds deeper than 200 fathoms, are included in the survey. For this reason, the survey estimates should be expected to underestimate the true biomass by some extent. However, while this assumption can provide a positive 'buffer' in a general sense, the Council does not feel that this factor should be incorporated into any qualitative or quantitative assessment of harvest rates without explicitly stated parameters. The harvest rate employed in this fishery would also become more of an issue if the catch approximated the TAC level. In

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000[1]
TAC									10	10	10	10	10	10	10	9
Catch	6	6.7	6.2	3.9	3.3	2.4	1.9	2.5	4.8	5.1	4.8	4.7	6.2	5.80	5.20	3.85

[1]Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

dealing with this uncertainty in the context of managing risk, the Council notes that as the harvest (and risk) increases, there will be a greater need for caution.

On an interim basis pending the development of a longer term management strategy, as recommended for the last 2 years, the FRCC recommends continuation of the TAC for Unit 3 Redfish in 2001/2002 at 9,000t.

Results from studies indicate that redfish in the Gulf of Maine are genetically distinct from redfish in the rest of Unit 3. These results are potentially very significant in future management of the stocks in both areas, particularly given the existing flexibility of the fleets to capture available quotas substantially in one area or the other. It is extremely important that follow up work be completed in an expeditious fashion.

The FRCC reiterates its previous recommendation that DFO bring together scientists, industry and managers to identify and priorize work that needs to be undertaken as follow-up to the results of the Redfish Multidisciplinary Research Program. This initiative should be undertaken, and sufficient human and financial resources should be brought to bear, with the objective of incorporating results into the future management of the various stocks as soon as possible.

Regardless of the action taken as a result of the aforementioned follow-up initiative, it is important that interested parties continue to monitor any potential shifts in effort and catches of redfish to ascertain whether ranges of available redfish concentrations (and those of other stocks in the area) may be contracting.

Sources

DFO Science

SSR A1-01(1999) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and 3 and in Division 3O

SSR A3-35(2000) Updates on selected Scotian Shelf groundfish stocks in 2000

FRCC Consultations

Shelburne, NS (November 22)
Sydney, NS (November 23)
Halifax, NS (November 24)

Written Briefs

Inshore Fisheries Ltd. – Claude d'Entremont (2000-010-00479)

Scotia Fundy Mobile Gear Fishermen's Association – Brian Giroux (2000-010-00480)

Council's Views on Stock Status

Overall Stock Condition:	apparently stable
	Compared to average
Spawning Biomass:	uncertain but apparently stable
Total Biomass:	uncertain but apparently stable
Recruitment:	moderate; less intermittent than other redfish stocks
Growth and Condition:	good; typical for this stock
Age Structure:	stable
Distribution:	harvest has shifted more towards the Gulf of Maine in recent years
Recent Exploitation:	uncertain *

* While DFO refers to the underestimation of the total biomass and to the probability that exploitation remains below $F_{0.1}$, the Council notes that recent catches have approximated ½ of the available TAC and also makes note of the opinion that redfish stocks feature recruitment and growth characteristics that are substantially different from other species, and therefore that they may not be managed to best advantage under the yield-per-recruit model based on the $F_{0.1}$ level of exploitation. It is expected that the development of a longer term management strategy will explicitly set a reasonable target harvest rate for this stock.

The FRCC requests that DFO continue to monitor and report on catch rates and catch length frequencies for each of the main redfish fishing areas within Unit 3 over the next 12 months.

This data may prove valuable in the future as long-term strategies are constructed in concert with the fishing industry.

The FRCC recommends that DFO investigate ways to provide the Council with a methodology that will monitor trends and provide more reliable indices of the Unit 3 redfish stock.

History of FRCC Recommendations

The Council recommended that the **1994** TAC for Unit 3 redfish be set at 10,000t. For **1995**, the Council recommended the TAC of 10,000t and also that the incidence of small fish be monitored and the area be closed to fishing when the incidence of small fish has reached an appropriate predefined level. The Council reiterated that there was a need for maintaining for **1996** the same small fish closure provisions as recommended in 1994, with a 1996 TAC of 10,000t. For **1997**, the Council recommended that the TAC for Unit 3 redfish remain at 10,000t. The Council also recommended that the small fish protocol be consistently applied and enforced, and other measures to avoid small fish should be evaluated, including increased mesh size. For **1998**, the FRCC repeated its recommendations that the TAC for this stock be set at 10,000t, and that small fish protocol should be consistently applied and rigidly enforced. The Council also recommended that the closed area known as the Bowtie should be redefined to optimize protection of small fish, and that DFO Science should seek to determine more precisely the sustainable catch level for this stock. For **1999 and 2000**, it was recommended that the TAC be reduced to 9,000t as an extra caution in the management of this resource as well as a series of information gathering and enforcement initiatives.

REDFISH - 3O

2000 CONSULTATIONS

An Atlantic-wide consultation was held in Halifax on November 24, 2000 and verbal and written comments were collected from industry representatives in late November and early December, 2000. The redfish industry participants at this meeting were of the general view that the status of the stock in 3O was similar to the previous year. Some participants noted that the prevalence of small fish in the catch (<22 cm) continued to increase, likely due to the recruitment to the fishery of small fish (12 - 19 cm) observed in earlier research surveys. Participants generally acknowledged that reduced catches in 2000 were a result of poor demand for these smaller-sized redfish rather than decreased catch rates *per se*.

ANALYSIS & RECOMMENDATIONS

The 2000 DFO Stock Status Report indicates that:

- The Spring and Fall research vessel surveys suggest the survey biomass remains at or slightly below previous estimates of 100,000t.
- The small redfish tracked by research surveys in earlier years are recruiting to the fishery, but there is concern that there has been little sign in recent research surveys of size groups smaller than 17cm.
- It is still not possible to describe overall trends in total stock size or to estimate the current size of the fishable portion of the population, nor is it possible to determine current fishing mortality rate.
- Recent survey results suggest that catches averaging 10,000t over the last number of years appear to have been sustainable.

Recent stock affinity studies suggest that redfish in this management unit are different from those in Units 1 to 3. It is important that the results of these studies be confirmed and that the relationship between these redfish and other neighboring management units, such as 3LN be considered further.

The Council notes that biomass estimates of this stock remain uncertain due to the nature of the bottom in this management unit and the apparently related distribution of fish by size. The FRCC has noted that there has been a shift in the distribution of the fishery during 2000 as compared with recent years, and that the large majority of the 2000 catch was taken from 3Oe, in the eastern-most portion of the management unit. Whether this shift is the result of fleet behavior or an actual change in the availability of the resource should be monitored closely in upcoming fisheries.

The Council also feels that the relative abundance of small (<17cm) redfish in research surveys might be an important indicator for this stock, since recent juvenile year classes seem to have been tracked for a time by earlier surveys and are now observed in the commercial fishery. The Council is sensitive that the relative shortage of such small fish in current research surveys might foretell reduced recruitment to coming commercial fisheries. However, the Council also understands that the most appropriate long term exploitation strategy for this stock needs to be considered within the context of the unusual pattern of recruitment for redfish stocks and the capabilities of science and industry to monitor and quantify changes in stock size and characteristics.

These concerns for future prospects notwithstanding, the Council notes that the currently recruiting year class should continue to grow and fully enter the fishery in the coming season. The Council considers that, for the 2001/2002 season, the recent approach to conservation of this stock remains appropriate.

The FRCC recommends that the TAC for 2001/2002 for 30 redfish be set at 10,000t.

The Council observes that the renewed interest the foreign fleets have taken in this resource outside 200 nautical miles in the unregulated fishery appears to be continuing in 2000/01. It seems likely that the total catch will exceed the established TAC for 3O redfish for the third consecutive year. If this trend continues,

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000[1]
TAC	20	20	20	14	14	14	14	14	14	10	10	10	10	10	10	10
Catch	12.9	11.1	13.2	11.2	11	9	7.6	20.6	13.1	4.4	2.8	9	4.7	9.1	12.5	1.82

*Canadian Catch as of Nov. 01/00

1. Figures are from the Integrated Fisheries Management Plan Atlantic Groundfish

and as the currently recruiting year class grows to a more marketable size, the Council is concerned that this stock will be increasingly vulnerable to over-exploitation.

The FRCC recommends that DFO develop options to bring fishing effort on 3O Redfish under control outside 200 nautical miles.

The Council recognizes the recent implementation of the small fish monitoring and reporting system to address the well documented pattern of landing small redfish from this management unit, and feels that this initiative must be continued in future years.

The FRCC recommends that the small fish protocol be applied to all fleets harvesting the resource throughout the range of the stock, and that it be rigorously enforced.

History of FRCC Recommendations

In November 1993, the Council recommended reduction of the TAC to 10,000t for **1994**. In November 1994, the Council expressed its concern over the uncertainties related to the origin and abundance of small redfish in this Division. The Council recommended that the **1995** TAC be set at 10,000t, that a small fish protocol be established to protect juvenile redfish and that research be accelerated to determine the origin of the small fish found in this Division. The Council recommended a **1996** TAC at 10,000t and continuation of small fish protocols.

For **1997**, Council recommended a TAC of 10,000 and further recommended that small fish protocols remain in place and apply to all fleets harvesting the resource throughout the range of the stock. The FRCC also indicated that modifications to gear should be examined to reduce the catch of small fish while minimizing post selection mortality.

Since **1998**, the Council has recommended that the TAC for 3O redfish be maintained at 10,000t, that further scientific effort be applied to determine sustainable levels of harvesting for this stock; and that small fish protocols remain in place. **For 1999**, the Council also recommended that a DFO-industry workshop be established to address the issues associated with the capture of juvenile redfish, including the definition of closed or restrictive areas, with results of this workshop to be included as part of the CHP for all fleets in this fishery for 1998. **For 2000/2001**, DFO Science Branch was requested to investigate and provide advice regarding potential small fish closure areas for potential implementation in the year 2000.

Sources

DFO Science

SSR A1-01(2000) Status of Redfish Stocks in the Northwest Atlantic: Redfish in Units 1, 2, and in Division 3O

FRCC Consultations

Halifax, NS (November 24)

Written Briefs

No briefs received

Council's Views on Stock Status

Overall Stock Condition:	stable
	Compared to average
Spawning Biomass:	uncertain
Total Biomass:	apparently stable
Recruitment:	good, may decline
Growth and Condition:	good; typical for this stock
Age Structure:	uncertain
Distribution:	unchanged
Recent Exploitation:	uncertain

Appendix 1: Science Priorities Letter

SCIENCE PRIORITIES LETTER

December 20, 2000

The Honourable Herb Dhaliwal, P.C., MP
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, ON
K1A 0E6

Dear Minister,

A significant component of the mandate of the Fisheries Resource Conservation Council (FRCC) is to advise you on appropriate priorities for science. Recommendations are presented on a regular basis (Science Priorities letter of January 1994, December 1996, March 1998 and March 1999). Scientific issues that should be addressed as a priority and that are still relevant are also raised in the FRCC's Report *"A Groundfish Conservation Framework for Atlantic Canada"* (FRCC.97.R3, July 1997). While the Council makes specific recommendations on scientific activities along with its regular stock-by-stock recommendations, this letter gives us the opportunity to address general science issues and to recommend basic directions with respect to DFO Science priorities.

The FRCC is pleased to see that several of our previous recommendations have been implemented or are incorporated in Science research programs. For instance, important progress has been made in the understanding of redfish population structures; the "recruitment dilemma" which the FRCC has underlined as an important issue was addressed and a report was written, as suggested by the Council; Science-Industry initiatives are also making progress and, in some areas, relationships between scientists and stakeholders have improved. Several of the issues raised previously, however, remain valid and are raised again in this letter.

The context within which DFO Science and the FRCC are working is evolving. Ecosystem-oriented management and objectives-based management, on DFO's part, as well as the design of Fisheries Resource Conservation Plans, on the part of the FRCC, require an integrated approach. This approach should be designed in a clear framework and should include knowledge improvement, information gathering and treatment and an open and transparent process to convene scientific results and findings to stakeholders. Exploited stocks are subject to impacts from elements other than fishing (climate change, predator-prey relations, activities such as oil and gas exploration and exploitation, marine transportation, etc.) that should be scrutinised and better understood. It is in the context of such widely based approaches, and to support the development of a longer-term planning approach that we identify the following needs and make our recommendations.

A NEED FOR AN INTEGRATED AND CO-ORDINATED VISION

DFO has launched several initiatives dealing with the Precautionary Approach, objectives-based fisheries management and Integrated Management, in the Science, Fisheries Management and Ocean Sectors of your Department. There is a widespread perception by Council members and many stakeholders that, while each of these initiatives looks interesting and promising when taken in isolation, a lot of confusion and overlap exists. Approaches, and even terminology, vary between Sectors, Regions and, in some cases, within Sectors or Regions. In that context, it is difficult to understand where we are going and what is supposed to be achieved.

The FRCC appreciates that the issues are complex and that a consideration of a variety of approaches is a necessary preliminary step. However, the FRCC notes, once again, that research groups still have a tendency to work in isolation and do not take full advantage of the expertise existing in different regions and disciplines, inside and outside DFO.

The Council feels that a clear common vision is necessary, even if practical implementation has to be adjusted to local specifics. Strong leadership is needed.

The FRCC feels that it is time, now, to compare and analyse those various approaches and to achieve a common view within DFO. Therefore, **the FRCC recommends that a major symposium involving all DFO Sectors as well as external experts be organized to synthesize the various views and approaches inside DFO and to draw a common framework related to long-term planning for the Precautionary Approach, objectives-based fisheries management and Integrated Management initiatives.**

A NEED TO IMPROVE KNOWLEDGE

When dealing with the "recruitment dilemma", scientists, while providing very useful information and analysis, recognise that several questions remain unanswered. While the remaining low biomass of groundfish is able to produce significant amounts of young fish, mortality is still very high. Hydro-climate and predator-prey interactions are proposed reasons, without clear scientific evidence. **Science should address a very basic question: why and how fish disappeared.**

In the medium term, the apparent high mortality rates experienced by some stocks in the 1990's (*e.g.* 2J3KL cod, 4VsW cod, redfish year-classes) need explanation.

Interactions between stocks have to be better understood, and in particular the predator-prey relationship has to be scrutinised. For example, it is surprising to see the scarcity of data related to capelin which is generally considered as a key forage species. **Studies on predator-prey relationships, and specifically on groundfish consumption by seals must be pursued in order to determine just what the impact of seals is and what might be the impact of a reduction in seal populations.**

On the long term, effects of climate change on fisheries must be studied. Several of our exploited species are located at their extreme ecological range: this makes them very sensitive and perhaps vulnerable to climate change. It is then important that we better understand how fish populations are likely to change in the future. The observed warming of Atlantic Canadian waters raises many questions and concerns in this respect.

We also need to improve our knowledge on each stock. Stock mixing, spatial distribution, migration patterns, spawning components and fish habitats remain major scientific issues. In fact, **we need a comprehensive understanding of the stocks' spatial and temporal dynamics.**

The FRCC recommends specifically that:

- **Stock mixing and delimitation of management units remain scientific priorities - while a lot of improvements have been made, clarification is still needed on:**
  - **the structure of the cod complex in 3Pn-3Ps-3L;**
  - **the relations between inshore and offshore cod stock components in the 2J3KL area;**
  - **the validity of the delimitation of redfish in Units 1 and 2;**
  - **the 4TVW white hake population structures.**
- **Critical habitats be defined and mapped;**
- **Spawning areas and periods be defined and mapped;**
- **Genetic studies, chemical studies and tagging programs be continued in order to delineate populations. They should be complemented by other available technologies such as electronic tags.**

A NEED FOR A GOOD INFORMATION BASE

Gathering relevant information is a major scientific duty. Data should come from several complementary sources, using the best scientific tools available.

The FRCC reiterates the importance of scientific surveys as essential elements of the stock assessment process. In addition, they gather important information on oceanographic conditions and on fundamental biological data. **Once again, we recommend that surveys not be modified without a full review and acknowledgement of the impact on the reliability of scientific data.**

Science-Industry scientific initiatives have proven to be important tools to complement scientific data gathering and to foster co-operation and understanding between scientists and fishers. They should be continued and expanded. They should not be seen as a way for DFO to abandon part of its scientific responsibilities, or of shifting the responsibility for data gathering to industry. Considering the diversity of such Science-Industry initiatives and the difficulties in implementing new ones, **the FRCC reiterates its previous recommendation to appoint an Atlantic co-ordinator**. The mandate of this co-ordinator would be to harmonise initiatives among Regions and stocks, and to promote Science-Industry co-operation both outside and inside DFO.

After several years of activities, sentinel fisheries are now part of the stock assessment process. The FRCC however, is aware that those activities still raise scepticism within both the scientific and fishing communities. The validity of the process and of the data is questioned by some. **The FRCC recommends that a sentinel fisheries program review be implemented in order to assess the process, the quality of the data provided, and the means to improve these activities.**

The FRCC recognizes that funding for some sentinel fisheries projects has recently been made part of the Department's A-base budget. The Council was an early proponent of these projects, and has long championed them, and it is heartening to see their institution into the Department's regular operating budget.

Fishers knowledge is recognised widely as a valuable source of important information. To be useable, this information must be organised and must have a channel to be transmitted. **The FRCC recommends that DFO seek the help of social scientists to organise efficient fishers knowledge gathering and treatment.**

New measures to provide access to data must also be developed. For example, spatially organised data, such as scientific surveys, fishing effort, and catches, could be incorporated into a Geographic Information System that could be used, for instance, to examine how various measures would affect fish and fishers.

A NEED FOR AN IMPROVED SCIENTIFIC PROCESS

DFO Science has decided not to undertake full assessments for every stock every year. The FRCC appreciate that such an extensive exercise may not be necessary, nor financially feasible. **However, in order to be able to achieve its mandate and to make rational recommendations, the Council recommends the following elements:**

- **A schedule for assessments be designed and followed. The FRCC wants to avoid an "open-ended" postponing of assessments. For our own long-term planning purposes, we also need to know when assessments can be expected.**
- **The decision on which stock has to be fully assessed, and which has not, should be transparent (*i.e.* involving stakeholders) and should be based on precise and widely accepted criteria. A first criterion could be the fragility of the stock or to put it differently, "how long can we wait for a new assessment before we do irreversible damage to a stock". Other criteria might also be used, such as the importance of stocks for the local economy, or whether any significant change to a stock is foreseeably imminent.**
- **When assessments are not conducted, basic information necessary to evaluate stock trends (research survey data, industry survey data, length or age distribution, etc.) should be provided.**

The Regional Advisory Process (RAP) is a major improvement of the scientific process. It is, however, the subject of criticism. Those criticisms refer to the complexity of the scientific process which appears to be too opaque to attendees, to the fact that no documents are provided for analysis in advance of the meeting, and to the reliability of data used. It is also evident that the ways in which RAP sessions are organised and conducted vary tremendously from one Region to the other.

The FRCC accepts the invitation extended to it during our recent meeting with the Assistant Deputy Minister, Science to meet with him and his senior staff to discuss issues related to the RAP and stock assessment processes.

The FRCC recommends that the RAP be harmonised between regions in terms of mandate, stakeholder representation and a consistency of approaches. Documents to be discussed should be provided in advance of the meetings. During the course of the meeting, the status of the issues under discussion should be

summarised in an understandable manner. Stakeholders must be present – it should not be left to DFO staff to determine who might or might not have something to contribute to the process. The validity of data used and the reason why some are discarded should be clearly explained and recorded.

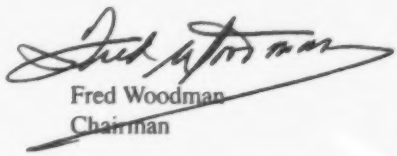
A NEED FOR SUPPORT FOR SCIENCE

In its previous letters, the FRCC has raised its concerns about the erosion of funding for science. We need good science and good science requires resources to support it in terms of money, equipment and human resources. This support has shrunken desperately in the recent past.

The FRCC appreciates the recent efforts to correct the situation and welcomes the extra funding recently provided. We urge you to consider that this should be an ongoing effort. The Council relies on DFO Science to provide it with basic information on stock status and on ecosystem changes and trends, in order to provide you with credible advice. Increasing our knowledge base must continue to receive enhanced support for the initiatives outlined here in order to build on what has been accomplished to date.

Minister, the Council trusts that this advice is helpful to you, and remains at your disposal to provide further advice on priorities for science within your Department.

Yours truly,



Fred Woodman
Chairman

Appendix 2: Scotian Shelf and Bay of Fundy Questionnaires

LETTER TO STAKEHOLDERS

October 30, 2000

Dear Stakeholder,

RE: Scotian Shelf 2000 Fishery Questionnaire

Please find attached questionnaires to provide feedback to the FRCC on your experience in the Scotian Shelf and Bay of Fundy fishery of 2000.

The FRCC requests that participants in the 2000 Scotian Shelf groundfishery take a few minutes to complete one or both of the questionnaires, depending on where you fish. As well, any comments and suggestions toward formalizing information the FRCC receives from fishermen are most welcome.

These questionnaires are a means to provide more structured information on fishing industry observations on the Scotian Shelf. They are designed to make it easier for respondents to provide feedback on their observations in the fishery by simply checking the most appropriate boxes in response to questions on stock status and fisheries observations. It is estimated that respondents can complete the questions in less than 10 minutes. As such, it is our objective to have as many people as possible complete the form in order to obtain a complete industry view of the Scotian Shelf groundfish stocks.

We believe that fishermen's information gathered in this form will develop much needed structure to the industry's view of stock status, and together with other sources of information, will provide important rationale to the FRCC's recommendations to the Minister of Fisheries and Oceans.

Completed questionnaires can be sent:

By FAX: (613) 998-1146
By mail: P.O. Box 2001, Station D, Ottawa, ON K1P 5W3
By e-mail: sheehant@dfo-mpo.gc.ca
By hand: Shelburne, November 22; Sydney, November 23; Halifax, November 24.

An electronic version of the questionnaire can be found on the FRCC website at: www.dfo-mpo.gc.ca/frcc. Completed questionnaires should be received by the FRCC prior to December 1, 2000.

Thank you in advance for your feedback and your contribution toward better understanding the status of our groundfish resources on the Scotian Shelf.

Sincerely,

Fred Woodman
Chairman

Questions to Participants in the 2000 Eastern Scotian Shelf Groundfishery

The FRCC requests the following information as an important part of its information sources for determining stock status of the Eastern Scotian Shelf (NAFO Subdivisions 4VW) groundfish resources of cod, haddock, flatfishes, skates, white hake, silver hake, pollock, and Atlantic halibut. Once compiled, this information is used to assist the FRCC in making recommendations to the Minister of Fisheries and Oceans for the year 2001/2002 fishery.

Instructions to participants: Please complete the following questions by checking off the appropriate box (✓) in the tables below. Additional written comments are welcome. The questionnaire should take about 5 to 10 minutes to complete. Thank you in advance for your valuable input.

I. Stock Status

1. What is your view of the **overall status in 2000** of groundfish stocks on the Eastern Scotian Shelf?

Stocks	Fully recovered	Improving compared to recent years but not fully recovered	Stable-unchanged from recent years	Declining compared to recent years	Stock in collapse	Did not catch stock
1. 4VWX5Z Pollock						
2. 3NOPs4VWX5Zc Atlantic Halibut						
3. 4VWX Silver Hake						
4. 4VsW Cod						
5. 4Vn(M-O) Cod						
6. 4TVW Haddock						
7. 4VW Flatfishes						
8. 4VsW Skates						
9. 4VWX5Zc White Hake						

2. How did your own **catch rates in 2000** compare with your catch rates in recent years?

Stocks	Highest ever	Better than recent years but not highest	Unchanged from recent years	Worse than in recent years	Lowest ever	Did not catch stock
1. 4VWX5Z Pollock						
2. 3NOPs4VWX5Zc Atlantic Halibut						
3. 4VWX Silver Hake						
4. 4VsW Cod						
5. 4Vn(M-O) Cod						
6. 4TVW Haddock						
7. 4VW Flatfishes						
8. 4VsW Skates						
9. 4VWX5Zc White Hake						

3. How **available were fish in 2000** compared with fish availability in recent years?

Stocks	Easiest ever to find	Easier to find than recently but not easiest	Unchanged from recent years	Harder to find than recent years	Hardest to find	Did not catch stock
1. 4VWX5Z Pollock						
2. 3NOPs4VWX5Zc Atlantic Halibut						
3. 4VWX Silver Hake						
4. 4VsW Cod						
5. 4Vn(M-O) Cod						
6. 4TVW Haddock						
7. 4VW Flatfishes						
8. 4VsW Skates						

9. 4VWX5Zc White Hake						

II. Observations while Fishing in 2000

1. How did the **timing of the fishery in 2000** compare with the timing of the fishery in recent years?

Stocks	Earliest ever	Earlier than recent years	Unchanged from recent years	Later than recent years	Latest ever	Did not catch stock
1. 4VWX5Z Pollock						
2. 3NOPs4VWX5Zc Atlantic Halibut						
3. 4VWX Silver Hake						
4. 4VsW Cod						
5. 4Vn(M-O) Cod						
6. 4TVW Haddock						
7. 4VW Flatfishes						
8. 4VsW Skates						
9. 4VWX5Zc White Hake						

2. What was the **overall condition of fish in 2000** catches compared to fish condition in recent years?

Stocks	Excellent fish condition	Improved condition compared to recent years	Unchanged condition from recent years	Declining condition compared to recent years	Poor fish condition	Did not catch stock
1. 4VWX5Z Pollock						
2. 3NOPs4VWX5Zc Atlantic Halibut						
3. 4VWX Silver Hake						
4. 4VsW Cod						
5. 4Vn(M-O) Cod						
6. 4TVW Haddock						
7. 4VW Flatfishes						
8. 4VsW Skates						
9. 4VWX5Zc White Hake						

3. How would you evaluate the **overall status of the Eastern Scotian Shelf ecosystem in 2000** (e.g., environmental conditions, water temperature, salinity, presence of other species, etc.) ?

	Highly positive	Better than in recent years	Unchanged from recent years	Deteriorated compared to recent years	Highly negative
Eastern Scotian Shelf ecosystem					

Please state evidence from indicators you observed in support of your response: _____

_____

_____

_____

4. How would you evaluate the presence of **predator species** on groundfish in 2000?

	High abundance of predators	Increased predators compared to recent years	Unchanged predators from recent years	Decreased evidence of predators compared to recent years	Relative absence of predators
Predator species					

Please state evidence of predator abundance you observed in support of your response: _____

_____

_____

_____

5. How would you evaluate the presence of **prey (forage) species** (e.g., sandlance, herring, shrimp, etc.) for groundfish in 2000?

	High abundance of prey	Increased prey compared to recent years	Unchanged prey from recent years	Decreased evidence of prey compared to recent years	Relative absence of prey
Prey species					

Please state evidence of prey abundance you observed in support of your response: _____

_____

_____

6. How would you evaluate the **age distribution of fish** in catches by stock in 2000?

Stocks	More small fish than ever	More small fish than usual	Similar in ages and size to past years	More big fish than usual	More older, big fish than ever	Did not catch stock
1. 4VWX5Z Pollock						
2. 3NOPs4VWX5Zc Atlantic Halibut						
3. 4VWX Silver Hake						
4. 4VsW Cod						
5. 4Vn(M-O) Cod						
6. 4TVW Haddock						
7. 4VW Flatfishes						
8. 4VsW Skates						
9. 4VWX5Zc White Hake						

7. Were the **Dockside Monitoring Program (DMP) and observer coverage effective** in dealing with stock conservation concerns (e.g., discarding, misreporting,etc.) on the Eastern Scotian Shelf in 2000?

	Very effective	Partly effective	Uncertain	Less than fully effective	Not at all effective
DMP and observer coverage effectiveness					

Suggestions to improve monitoring effectiveness: _____

_____

_____

_____

8. Do you believe that increased use of **management measures other than TACs,** e.g., more area closures for protecting spawning fish, or more gear restrictions to reduce bycatch, **would be effective** in dealing with groundfish stock conservation and rebuilding on the Eastern Scotian Shelf?

Increased use of Other management measures	Could be very effective	May be partly effective	Uncertain	Will likely be less than fully effective	Will not be at all effective
1. More Area closures					
2. More Gear restrictions					
3. Stricter Small fish protocol					

Suggestions regarding management measures other than TACs: _____

_____

_____

_____

_____

III. Information Sources

1. In your view, do the following **fishery information sources** accurately reflect stock removals and provide the means for estimating stock status?

Information Source	Highly underestimates stock removals	Somewhat underestimates stock removals	Reflects removals accurately	Somewhat overestimates stock removals	Highly overestimates stock removals	No comment/ Don't know
1. Port sampling						
2. At-sea sampling						
3. Sales slip data						
4. Quota statistics						

Suggestions to improve the reliability of fishery informa .on: _____

_____

_____

_____

_____

2. In your view, do the following **stock abundance surveys** accurately reflect year-over-year changes in actual stock abundance?

Stock Surveys	Highly underestimates abundance	Somewhat underestimates abundance	Reflects stock abundance accurately	Somewhat overestimates abundance	Highly overestimates abundance	No comment/ Don't know
1. Research vessels surveys, e.g., DFO						
2. Joint Industry/DFO surveys						
3. Sentinel surveys						

Suggestions to improve the reliability of fishery information: _____

_____

_____

_____

_____

3. Do you feel you have had an **adequate opportunity to express your views on stock status** through the various meetings listed below?

Meetings	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree	No comment
1. Scotia-Fundy RAP						
2. Meetings with DFO Science staff						
3. FRCC consultations						

Suggestions to improve information exchange: _____

_____

_____

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_____

IV. Resource Outlook

For the Eastern Scotian Shelf groundfish stocks, the FRCC is currently working on developing a set of criteria for stock conservation and rebuilding. These include: (1) recommending quotas for rebuilt stock below the $F_{0.1}$ level; (2) setting stock specific spawning stock biomass targets; and (3) accepting low probabilities for year-over-year possible decline in the spawning stock biomass. In the year 2001, the FRCC will be consulting DFO and the fishing industry to develop longer-term plans for the Eastern Scotian Shelf groundfish stocks. We invite you to provide preliminary feedback on the planning process, and criteria for stock conservation and rebuilding.

How important do you consider the following elements for effective longer-term planning for the Eastern Scotian Shelf groundfish stocks?

Planning elements	Very important	Somewhat important	Uncertain	Less important	Not at all important	No comment/ Don't know
1. Multi-year TACs, e.g., setting TACs for 3 to 5 running						
2. Biological objectives, e.g., absolute biomass limits and targets						
3. Stock reference point values, e.g., $F_{0.1}$						
4. Ecosystem considerations, e.g., predators, prey, habitat						
5. Socioeconomic considerations, e.g., employment, income						
6. Limits on year-to-year changes in TACs, e.g., no change greater than +20% or –20%						
7. Other (please specify) _____ _____						

Suggestions to improve effective longer-term planning: _____

_____

_____

_____

_____

_____

V. Respondent's Information

The following information is requested only to ensure data integrity and for data compilation purposes. This information will not be used in any way to identify the respondent and will remain confidential.

1. To what **fleet/gear sector** do you belong?

	FG less than 45'	FG 45'-65'	MG less than 65'	FG 65'-100'	MG 65'-100'	Vessels>100'
Fleet/Gear sector						

2. Please state your **home port and province**.

	Place name	Province
Home port		

3. What **Eastern Scotian Shelf groundfish stocks** did you direct for in 2000? *(Check all that apply.)*

	4VWX5Z Pollock	3NOPs4VWX5Zc Atlantic Halibut	4VWX5Zc Silver Hake	4VW Flatfish	4VWX Argentine	4VsW Skate	Unit 3 Redfish
Stocks fished							

4. In what **periods did you fish for Eastern Scotian Shelf** groundfish in 2000? *(Check all months that you fished.)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Fishing periods												

5. How many **years experience** do you have fishing Eastern Scotian Shelf groundfish stocks?

	One year	2 to 5 years	5 to 7 years	7 to 10 years	More than 10 years
Years experience					

Comments on this **questionnaire and suggestions for improving industry information** collection: _____

Thank you for your valuable time in completing this questionnaire. Please send completed questionnaire to:

By FAX: (613) 998-1146
By mail: P.O. Box 2001, Station D, Ottawa, ON K1P 5W3
By e-mail: **sheehant@dfo-mpo.gc.ca**
By hand: FRCC Consultation, November 23,2000 in Sydney, and November 24,2000 in Halifax

Questions to Participants in the 2000 Western Scotian Shelf and Bay of Fundy Groundfishery

The FRCC requests the following information as an important part of its information sources for determining stock status of the Western Scotian Shelf and Bay of Fundy (NAFO Subdivisions 4X+5Y) groundfish resources of cod, haddock, flatfishes, skates, white hake, silver hake, pollock, and Atlantic halibut. Once compiled, this information is used to assist the FRCC in making recommendations to the Minister of Fisheries and Oceans for the year 2001/2002 fishery.

Instructions to participants: Please complete the following questions by checking off the appropriate box (✓) in the tables below. Additional written comments are welcome. The questionnaire should take about 5 to 10 minutes to complete. Thank you in advance for your valuable input.

I. Stock Status

1. What is your view of the **overall status in 2000** of groundfish stocks on the Western Scotian Shelf and Bay of Fundy?

Stocks	Fully recovered	Improving compared to recent years but not fully recovered	Stable-unchanged from recent years	Declining compared to recent years	Stock in collapse	Did not catch stock
1. 4X Cod						
2. 4X Haddock						
3. 4VWX5Z Pollock						
4. 3NOPs4VWX5Zc Atlantic Halibut						
5. 4VWX Silver Hake						
6. 4X Flatfishes						
7. 4VWX5Zc White Hake						

2. How did your own **catch rates in 2000** compare with your catch rates in recent years?

Stocks	Highest ever	Better than recent years but not highest	Unchanged from recent years	Worse than in recent years but not lowest	Lowest ever	Did not catch stock
1. 4X Cod						
2. 4X Haddock						
3. 4VWX5Z Pollock						
4. 3NOPs4VWX5Zc Atlantic Halibut						
5. 4VWX Silver Hake						
6. 4X Flatfishes						
7. 4VWX5Zc White Hake						

3. How **available were fish in 2000** compared with fish availability in recent years?

Stocks	Easiest ever to find	Easier to find than recent years but not easiest	Unchanged from recent years	Harder to find than in recent years	Hardest ever to find	Did not catch stock
1. 4X Cod						
2. 4X Haddock						
3. 4VWX5Z Pollock						
4. 3NOPs4VWX5Zc Atlantic Halibut						
5. 4VWX Silver Hake						
6. 4X Flatfishes						
7. 4VWX5Zc White Hake						

II. Observations while Fishing in 2000

1. How did the **timing of the fishery in 2000** compare with the timing of the fishery in recent years?

Stocks	Earliest ever	Earlier than recent years but not earliest	Unchanged from recent years	Later than recent years but not latest	Latest ever	Did not catch stock
1. 4X Cod						
2. 4X Haddock						
3. 4VWX5Z Pollock						
4. 3NOPs4VWX5Zc Atlantic Halibut						
5. 4VWX Silver Hake						
6. 4X Flatfishes						
7. 4VWX5Zc White Hake						

2. What was the **overall condition of fish in 2000** catches compared to fish condition in recent years?

Stocks	Excellent fish condition	Improved condition compared to recent years	Unchanged condition from recent years	Declining condition compared to recent years	Poor fish condition	Did not catch stock
1. 4X Cod						
2. 4X Haddock						
3. 4VWX5Z Pollock						
4. 3NOPs4VWX5Zc Atlantic Halibut						
5. 4VWX Silver Hake						
6. 4X Flatfishes						
7. 4VWX5Zc White Hake						

3. How would you evaluate the **overall status of the Western Scotian Shelf and Bay of Fundy ecosystem in 2000** (e.g., environmental conditions, water temperature, salinity, presence of other species, etc.) ?

	Highly positive	Better than in recent years	Unchanged from recent years	Deteriorated compared to recent years	Highly negative
Western Scotian Shelf and Bay of Fundy ecosystem					

Please state evidence from indicators you observed in support of your response: _____

_____

_____

_____

4. How would you evaluate the presence of **predator species** on groundfish in 2000?

	High abundance of predators	Increased predators compared to recent years	Unchanged predators from recent years	Decreased evidence of predators compared to recent years	Relative absence of predators
Predator species					

Please state evidence of predator abundance you observed in support of your response: _____

_____

_____

_____

5. How would you evaluate the presence of **prey (forage) species** (e.g., sandlance, herring, shrimp, etc.) for groundfish in 2000?

	High abundance of prey	Increased prey compared to recent years	Unchanged prey from recent years	Decreased evidence of prey compared to recent years	Relative absence of prey
Prey species					

Please state evidence of prey abundance you observed in support of your response: _____

_____

_____

_____

6. How would you evaluate the **size and age distribution of fish** in catches by stock in 2000?

Stocks	More small fish than ever	More small fish than usual	Similar in ages and size to past years	More big fish than usual	More older, big fish than ever	Did not catch stock
1. 4X Cod						
2. 4X Haddock						
3. 4VWX5Z Pollock						
4. 3NOPs4VWX5Zc Atlantic Halibut						
5. 4VWX Silver Hake						
6. 4X Flatfishes						
7. 4VWX5Zc White Hake						

7. Were the **Dockside Monitoring Program (DMP) and observer coverage effective** in dealing with stock conservation concerns (e.g., discarding, misreporting,etc.) on the Western Scotian Shelf and Bay of Fundy in 2000?

	Very Effective	Partly effective	Uncertain	Less than fully effective	Not at all effective
DMP and observer coverage effectiveness					

Suggestions to improve monitoring effectiveness: _____

_____

_____

_____

8. Do you believe that increased use of **management measures other than TACs,** e.g., more area closures for protecting spawning fish, or more gear restrictions to reduce bycatch, **would be effective** in dealing with groundfish stock conservation and rebuilding on the Western Scotian Shelf and Bay of Fundy?

Increased use of Other management measures	Could be very Effective	May be partly effective	Uncertain	Will likely be less than fully effective	Will not be at all effective
1. More Area closures					
2. More Gear restrictions					
3. Stricter Small fish protocol					

Suggestions regarding management measures other than TACs: _____

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_____

_____

_____

III. Information Sources

1. In your view, do the following **fishery information sources** accurately reflect stock removals and provide the means for estimating stock status?

Information Source	Highly underestimates stock removals	Somewhat underestimates stock removals	Reflects removals accurately	Somewhat overestimates stock removals	Highly overestimates stock removals	No comment/ Don't know
1. Port sampling						
2. At-sea sampling						
3. Sales slip data						
4. Quota statistics						

Suggestions to improve the reliability of fishery information: _____

2. In your view, do the following **stock abundance surveys** accurately reflect year-over-year changes in actual stock abundance?

Stock Surveys	Highly underestimates abundance	Somewhat underestimates abundance	Reflects stock abundance accurately	Somewhat overestimates abundance	Highly overestimates abundance	No comment/ Don't know
1. Research vessels surveys, e.g., DFO						
2. Joint Industry/DFO surveys						
3. Sentinel surveys						

Suggestions to improve the reliability of fishery information: _____

3. Do you feel you have had an **adequate opportunity to express your views on stock status** through the various meetings listed below?

Meetings	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree	No comment
1. Scotia-Fundy RAP						
2. Meetings with DFO Science staff						
3. FRCC consultations						

Suggestions to improve information exchange: _____

IV. Resource Outlook

For the Western Scotian Shelf and Bay of Fundy groundfish stocks, the FRCC is currently working on developing a set of criteria for longer-term stock conservation and growth. These include: (1) recommending quotas below the $F_{0.1}$ level; (2) setting stock specific spawning stock biomass targets; and (3) accepting low probabilities for year-over-year possible decline in the spawning stock biomass. In the year 2001, the FRCC will be consulting DFO and the fishing industry to develop longer-term plans for the Western Scotian Shelf and Bay of Fundy groundfish stocks. We invite you to provide preliminary feedback on the planning process, and criteria for stock conservation and growth.

How important do you consider the following elements for effective longer-term planning for the Western Scotian Shelf and Bay of Fundy groundfish stocks?

Planning elements	Very important	Somewhat important	Uncertain	Less important	Not at all important	No comment/ Don't know
1. Multi-year TACs, e.g., setting TACs for 3 to 5 running						
2. Biological objectives, e.g., absolute biomass limits and targets						
3. Stock reference point values, e.g., $F_{0.1}$						
4. Ecosystem considerations, e.g., predators, prey, habitat						
5. Socioeconomic considerations, e.g., employment, income						
6. Limits on year-to-year changes in TACs, e.g., no change greater than +20% or –20%						
7. Other (please specify) _____ _____						

Suggestions for effective longer-term planning: _____

_____

_____

_____

V. Respondent's Information

The following information is requested only to ensure data integrity and for data compilation purposes. This information will not be used in any way to identify the respondent and will remain confidential.

1. To what **fleet/gear sector** do you belong?

	FG less than 45'	FG 45'-65'	MG less than 65'	FG 65'-100'	MG 65'-100'	Vessels>100'
Fleet/Gear sector						

2. Please state your **home port and province**.

	Place name	Province
Home port		

3. What **Western Scotian Shelf and Bay of Fundy groundfish stocks** did you direct for in 2000? *(Check all that apply.)*

	4X Cod	4X Haddock	4VWX5Z Pollock	3NOPs4VWX5Zc Atlantic Halibut	4VWX Silver Hake	4X Flatfishes	Unit 3 Redfish
Stocks fished							

4. In what **periods did you fish for Western Scotian Shelf and Bay of Fundy** groundfish in 2000? *(Check all months that you fished.)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Fishing periods												

5. How many **years experience** do you have fishing Western Scotian Shelf and Bay of Fundy groundfish stocks?

	One year	2 to 5 years	5 to 7 years	7 to 10 years	More than 10 years
Years experience					

Comments on this **questionnaire and suggestions for improving industry information** collection: _____

Thank you for your valuable time in completing this questionnaire. Please send completed questionnaire to:

By FAX: (613) 998-1146
By mail: P.O. Box 2001, Station D, Ottawa, ON K1P 5W3
By e-mail: **sheehant@dfo-mpo.gc.ca**
By hand: FRCC Consultation, November 22,2000 in Shelburne, and November 24,2000 in Halifax

Appendix 3: FRCC Mandate and Membership

FRCC Terms of Reference

1. Introduction

The Government of Canada is committed to a more comprehensive approach to the conservation and management of our fisheries resource. This approach demands a better understanding of complex fisheries ecosystems - the interaction of fish with other species, predator-prey relationships, and also changes in the marine environment like ocean currents, water temperatures and salinity.

The Government of Canada is also committed to a more effective role in decision-making for those with practical experience and knowledge in the fishery.

The Minister of Fisheries and Oceans has established the Fisheries Resource Conservation Council (FRCC) as a partnership between government, the scientific community and the direct stakeholders in the fishery. Its mission is to contribute to the management of the Atlantic fisheries on a 'sustainable' basis by ensuring that stock assessments are conducted in a multi-disciplined and integrated fashion and that appropriate methodologies and approaches are employed; by reviewing these assessments together with other relevant information and recommending to the Minister total allowable catches (TACs) and other conservation measures, including some idea of the level of risk and uncertainty associated with these recommendations; and by advising on the appropriate priorities for science.

2. Definition of Conservation

Fisheries conservation is that aspect of the management of the fisheries resource which ensures that its use is sustainable and which safeguards its ecological processes and genetic diversity for the maintenance of the resource. Fisheries conservation ensures that the fullest sustainable advantage is derived from the resource and that the resource base is maintained.

3. Council Objectives

3.1 To help the government achieve its conservation, economic and social objectives for the fishery.The conservation objectives include, but are not restricted to:

3.1.1 rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near these levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish; and,

3.1.2 managing the pattern of fishing over the sizes and ages present in fish stocks and catching fish of optimal size.

3.2 To develop a more profound understanding of fish-producing ecosystems including the inter-relationships between species and the effects of changes in the marine environment on stocks.

3.3 To review scientific research, resource assessments and conservation proposals, including, where appropriate, through a process of public hearings.

3.4 To ensure that the operational and economic realities of the fishery, in addition to scientific stock assessments, are taken into account in recommending measures to achieve the conservation objectives.

3.5 To better integrate scientific expertise with the knowledge and experience of all sectors of the industry and thus develop a strong working partnership.

3.6 To provide a mechanism for public and industry advice and review of stock assessment information.

3.7 To make public recommendations to the Minister.

4. Mandate and Scope

4.1 The Fisheries Resource Conservation Council will address these objectives by bringing together industry, DFO science and fisheries management, and external scientific and economic expertise in one body.

4.2 The Council will:

4.2.1 advise the Minister on research and assessment priorities;

4.2.2 review DFO data and advise on methodologies;

4.2.3 consider conservation measures that may be required to protect fish stocks;

4.2.4 review stock assessment information and conservation proposals, including through public hearings, where appropriate; and,

4.2.5 make written public recommendations to the Minister on TACs and other conservation measures.

4.3 The Council may recommend any measures considered necessary and appropriate for conservation purposes such as TACs, closure of areas to fishing during specific periods, approaches to avoid catching sub-optimal sized fish or unwanted species, and restrictions on the characteristics or use of fishing gears.

4.4 The Council's scope includes Canadian fish stocks of the Atlantic and Eastern Arctic Oceans. In the first instance, the Council will address groundfish, and then subsequently take on responsibility for pelagic and shellfish species.

4.5 The Council may also advise the Minister on Canada's position with respect to straddling and transboundary stocks under the jurisdiction of international bodies such as the Northwest Atlantic Fisheries Organization (NAFO).

5. Size, Structure and Make-Up

5.1 The Council will consist of not more than 14 members with an appropriate balance between 'science' and 'industry'.

5.2 Members are chosen on merit and standing in the community, and not as representatives of organizations, areas or interests.

5.3 'Science' members, are drawn from government departments, universities or international posts, and are of an appropriate mix of disciplines, including fisheries management and economics.

5.4 'Industry' members are knowledgeable of fishing and the fishing industry and understand the operational and economic impacts of conservation decisions.

5.5 All members of the Council are appointed by the Minister.

5.6 All members, including the Chairperson, are appointed for a three year term; terms can be renewed.

5.7 Members appointed from DFO serve 'ex officio'.

5.8 Members have to disclose any interest in the Atlantic or Eastern Arctic fishery and take appropriate measures so as to avoid potential or real conflict of interest situations during the term of appointment.

5.9 The four Atlantic Provinces, Quebec and the Northwest Territories may each nominate one delegate to the Council. These delegates have access to the Council's information, and may participate fully in meetings, but will not be asked to officially endorse the formal recommendations to the Minister.

5.10 The Council is supported by a small Secretariat, to be located in Ottawa. The Secretariat will:

5.10.1 provide administrative support for the functioning of the Council;

5.10.2 provide a technical science and fisheries management support;

5.10.3 organize Council meetings;

5.10.4 record decisions of the Council;

5.10.5 undertake a professional communications function for the Council, providing a central point for communications to and from the Council; and

5.10.6 undertake such other matters as from time to time might be appropriate.

5.11 The Chairman may appoint an Executive Committee, consisting of the Chairman, Vice-Chairman, and three other Members.

5.12 In addition, the Chairman may, from time to time, strike an 'ad hoc' committee to deal with a specific issue.

6. ACTIVITIES:

6.1 Reviews appropriate DFO science research programs and recommends priorities, objectives and resource requirements.

6.2 Considers scientific information - including biology, and physical and chemical oceanography, taking into account fisheries management, fishing practices, economics and enforcement information.

6.3 Conducts public hearings wherein scientific information is presented and/or proposed conservation measures/options are reviewed and discussed.

6.4 Recommends TACs and other conservation measures.

6.5 Prepares a comprehensive, long-term plan and a work plan for the Council which are reviewed annually at a workshop with international scientists and appropriate industry representatives.

6.6 Ensures an open and effective exchange of information with the fishing industry and contributes to a better public understanding of the conservation and management of Canada's fisheries resource.

FRCC MEMBERSHIP:

MEMBERS:

Fred Woodman, Chairman
Jean-Claude Brêthes, Vice-Chair
Osborne Burke
Bill Broderick
Bruce Chapman
Ernest Després
Jean Guy d'Entremont
Gabe Gregory
Frank Hennessey
Dan Lane
Edward McAlduff
John Pope
George Rose
Louis Schofield
Maureen Yeadon

PROVINCIAL DELEGATES:

Ray Andrews, Nunavut
Mario Gaudet, New Brunswick
David Gillis, Prince Edward Island
Dario Lemelin, Québec
Tom Dooley, Newfoundland and Labrador
Clary Reardon, Nova Scotia

EX OFFICIO:

Gilles Belzille
Barry Rashotte
Denis Rivard

SECRETARIAT:

Michel G. Vermette, Executive Director
Tracey Sheehan
Helena DaCosta
Debra Côté

200 Mile Fishing Zone and NAFO Fishing Boundaries